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# *Archives of* PHYSICAL MEDICINE

*Official Journal American Congress of Physical Medicine*  
(Formerly Archives of Physical Therapy)



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**28th Annual Session**  
**AMERICAN CONGRESS OF PHYSICAL MEDICINE**

August 28, 29, 30, 31, September 1, 1950

HOTEL STATLER

BOSTON

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VOLUME XXXI

APRIL, 1950

NO. 4

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# **American Congress of Physical Medicine**

**28th Annual**

## **Scientific and Clinical Session**

**and**

### **Instruction Seminar**

**August 28, 29, 30, 31, Sept. 1, 1950**



**Official Headquarters**  
**HOTEL STATLER**  
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# INSTRUCTION SEMINAR

In Conjunction with the

## 28th Annual Scientific and Clinical Session

### AMERICAN CONGRESS OF PHYSICAL MEDICINE

August 28, 29, 30 and 31, 1950

HOTEL STATLER

BOSTON, MASS.

#### TENTATIVE SCHEDULE

Physicians only may enroll for letter series

##### MONDAY MORNING — AUGUST 28

- |   |   |
|---|---|
| (A) 10:00-10:50 A.M.<br>Neuro-anatomy of the<br>brain and spinal cord<br>Parlor B | (B) 11:00-11:50 A.M.<br>Neuro-anatomy of the<br>brain and spinal cord<br>Parlor B |
|---|---|

##### MONDAY AFTERNOON — AUGUST 28

- |  |  |
|--|--|
| (C) 3:00-3:50 P.M.<br>Pathologic physiology<br>of lesions of the brain<br>(types and localizations<br>producing motor dis-<br>turbances)<br>Parlor B | (D) 4:00-4:50 P.M.<br>Pathologic physiology<br>of lesions of the spinal<br>cord (localization of le-<br>sions, including polio-<br>myelitis)<br>Parlor B |
|--|--|

##### TUESDAY MORNING — AUGUST 29

- |  |   |
|--|---|
| (E) 8:30-9:20 A.M.<br>Pathologic physiology<br>of peripheral nerve le-<br>sions, including the<br>neuritis<br>Parlor B | (F) 9:30-10:20 A.M.<br>The physiologic effects<br>of heat<br>Parlor B |
|--|---|

##### WEDNESDAY MORNING — AUGUST 30

- |   |  |
|---|--|
| (G) 8:30-9:20 A.M.<br>Physics of muscular<br>action<br>Parlor B | (H) 9:30-10:20 A.M.<br>Physics of muscular<br>action<br>Parlor B |
|---|--|

##### THURSDAY MORNING — AUGUST 31

- |   |  |
|---|--|
| (J) 8:30-9:20 A.M.<br>Medical writing<br>Parlor B | (K) 9:30-10:20 A.M.<br>Medical writing<br>Parlor B |
|---|--|

Physicians and registered physical and occupational therapists may enroll for numbered series

##### MONDAY MORNING — AUGUST 28

- |  |   |
|--|---|
| (1) 10:00-10:50 A.M.<br>Recent Hormonal In-<br>vestigations in Rheu-<br>matoid Arthritis<br>Parlor C | (2) 1:00-11:50 A.M.<br>Recent Hormonal In-<br>vestigations in Rheu-<br>matoid Arthritis<br>Parlor C |
|--|---|

##### MONDAY AFTERNOON — AUGUST 28

- |   |  |
|---|--|
| (3) 3:00-3:50 P.M.<br>Physical Medicine in<br>rheumatoid arthritis, in<br>the light of the new<br>treatment<br>Parlor C | (4) 4:00-4:50 P.M.<br>The clinical use and<br>dangers of microwave<br>Parlor C |
|---|--|

##### TUESDAY MORNING — AUGUST 29

- |  |  |
|--|--|
| (5) 8:30-9:20 A.M.<br>Analysis of pathologic<br>gaits, and gait training<br>Parlor C | (6) 9:30-10:20 A.M.<br>Resistive exercises in<br>treatment of poliomye-<br>litis<br>Parlor C |
|--|--|

##### WEDNESDAY MORNING — AUGUST 30

- |   |   |
|---|---|
| (7) 8:30-9:20 A.M.<br>Useful mechanical de-<br>vices used in Physical<br>Medicine and Rehabili-<br>tation<br>Parlor C | (8) 9:30-10:20 A.M.<br>Exercise in the treat-<br>ment of asthma<br>Parlor C |
|---|---|

##### THURSDAY MORNING — AUGUST 31

- |  |   |
|--|---|
| (9) 8:30-9:20 A.M.<br>Indications for ortho-<br>pedic reconstruction in<br>poliomyelitis<br>Parlor C | (10) 9:30-10:20 A.M.<br>Disabilities of the<br>shoulder<br>Parlor C |
|--|---|

*Note: The Committee on Education of the American Congress of Physical Medicine is in charge of the instruction seminar. It is purposely planned to limit the subjects in any year to a few topics in order to devote enough time to those subjects to give those attending a good review, both from the standpoint of basic knowledge and from the clinical standpoint. Certain groups of these subjects will be repeated every three to five years.*

Courses will be offered in two separate groups: One group of ten courses will be offered on basic subjects and this group will be open only to physicians. A second group of ten courses will present more general and clinical subjects. Physicians and therapists may register for the second group of courses. Only those therapists registered with the American Registry of Physical Therapy Technicians or the American Occupational Therapy Association will be permitted to enroll for the instruction courses. The charge for a single lecture is \$2.00, for a full schedule of ten lectures, \$15.00.

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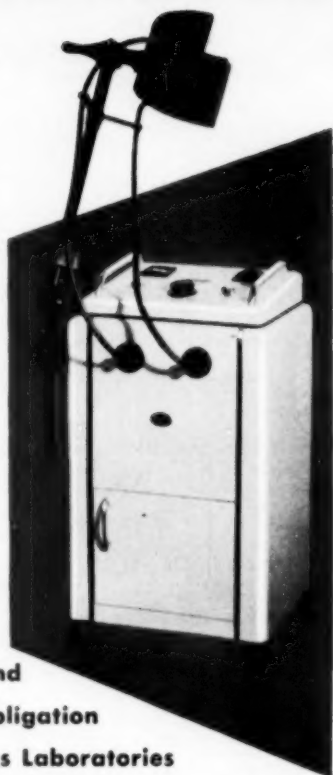
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# Contents—Apr. 1950

Volume XXXI

No. 4

## ARCHIVES OF PHYSICAL MEDICINE

(Formerly Archives of Physical Therapy)

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Original contributions, exchanges and books for review should be forwarded to the Editorial Office. All business matters including advertising should be handled through the Executive Office, 30 N. Michigan Ave., Chicago 2, Illinois. The statements in the manuscripts published in the ARCHIVES OF PHYSICAL MEDICINE are made solely on the responsibility of the author. The American Congress of Physical Medicine does not assume any responsibility for statements contained therein. Manuscripts accepted for publication in ARCHIVES OF PHYSICAL MEDICINE are for exclusive publication and may not be published elsewhere.

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### ORIGINAL ARTICLES

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### EDITOR OF THE MONTH

EARL C. ELKINS, M.D.  
Rochester, Minn.

Printed in U.S.A.

**WESTERN SECTION**  
**AMERICAN CONGRESS OF PHYSICAL MEDICINE**  
**LETTERMAN GENERAL HOSPITAL**  
**PHYSICAL MEDICINE CONFERENCE ROOM**  
**SAN FRANCISCO**

Sunday, June 25, 1950

Frances Baker, M.D., Chairman

Clarence W. Dail, M.D., Secretary

9:30 Registration.

10:00 Principles of Muscle Dynamics: H. J. Ralston, Ph.D.

Principles of Muscular Action: Verne T. Inman, M.D.

11:30 Business Meeting.

Consideration of future plans.

12:00 Luncheon.

2:00 to 4:00 —

Diagnostic Methods in Neuromuscular Disease: Col. A. E. White.

1. Use of the Electromyograph — Evaluation of Results.

2. Use of the Neuro-Dermometer — Evaluation of Results.

Patients and material to be presented by Col. White and staff.

Discussion: James C. Golseth, M.D.

S. M. Dorinson, M.D.

Verne T. Inman M.D.

Although definite plans cannot be made at this time it is expected that certain leaders in physical medicine and rehabilitation will be present and will participate in the program. It should be noted that the American Rheumatism Association and the American Medical Association meet just before and after this program.

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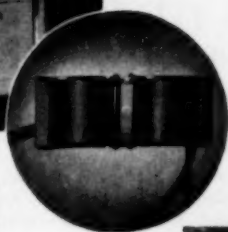
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## AMERICAN CONGRESS OF PHYSICAL MEDICINE

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**SPRING SESSION**

**Thursday, May 11, 1950**

**University Hospitals, State University of Iowa**

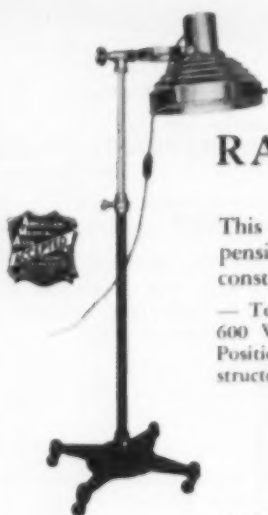
**Iowa City, Iowa**

**Morning Session — 9:30 A. M.**

There will be an all day session on physical medicine and rehabilitation which is open to physicians, other professional personnel and their guests. Luncheon will be available on the grounds at a nominal sum. Provision has been made for those who may wish to arrive the night of Wednesday, May 10, at the Jefferson Hotel. For detailed information write the Secretary, Dr. William D. Paul, University Hospitals, State University of Iowa, Iowa City, Ia. Details of the program are not available for this issue of the ARCHIVES. There will be speakers from Washington University, St. Louis, Mo.; University of Minnesota; Mayo Clinic; University of Illinois and the State University of Iowa.

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## NEW DEVICES FOR DISABILITY EVALUATION \*

### 2. The Thumb Ergograph

F. A. Hellebrandt, M.D.

L. E. A. Kelso, B.S.

Sara Jane Houtz, M.S.

and

R. N. Eubank

RICHMOND, VA.

Previous work from this laboratory has presented the merits of ergography in disability evaluation.<sup>1</sup> Instruments applicable to the quantitative study of the work capacity of muscle groups activating all the joints of the upper extremity except those of the thumb have already been described.<sup>2</sup> So important is the thumb to the use of the hand that loss or serious impairment of the functions performed by this single digit entitles the disabled person to compensation equal to 33 1/3 per cent of that allowable for the hand in toto.<sup>3</sup>

The thumb normally functions in cooperation with the fingers. Unique to this digit is its exceptional mobility and the strength of its power of opposition. In general, it may be said that no task is more important in the rehabilitation of the disabled hand than restoration of these two functions. However, the emphasis of therapy is usually placed on passive mobilization of the joints of the thumb since it is difficult to grade exercise in a manner conducive to the optimal development of strength. Mobility without power is of limited value to the patient. DeLorme has emphasized that mobility develops *pari passu* with strength if the stress imposed is augmented progressively.<sup>4</sup> The purpose of this paper is to present an indicating and recording device which permits flexion, extension, abduction, adduction and opposition of the thumb against graded resistance, thus enabling one to compute functional ability and estimate progress under treatment.

#### Principle of the Method

In principle this instrument is identical to the ergographs already described.<sup>2</sup> The force developed by the muscle being exercised or measured is applied to an axle which turns a wheel. Through the introduction of a load tower this simple machine is made to lift variable weights. Auxiliary indicating and recording devices permit work capacity of the muscle to be measured. The unique feature of the thumb ergograph is the construction of the axle which permits normal range movements in a natural anatomic posi-

\* From the Division of Clinical Research, Baruch Center of Physical Medicine and Rehabilitation, Medical College of Virginia, and the Electrical Laboratory, School of Engineering, University of Wisconsin. This work was supported in part by the Office of Naval Research (Project NR 172 492). The ergograph was constructed by the late James Hipple, mechanic of the State of Wisconsin General Hospital.

1. Hellebrandt, F. A., and Skowlund, H. V.: The Application of Ergography in Disability Evaluation. 1. The Normal Fatigue Curve, *Am. J. Occup. Therapy* 1:73 (April) 1947. Hellebrandt, F. A.: Research in Disability Evaluation, *J. Rehabilitation*, to be published.

2. Hellebrandt, F. A.; Skowlund, H. V., and Kelso, L. E. A.: New Devices for Disability Evaluation. 1. Hand, Wrist, Radial/ulnar, Elbow and Shoulder Ergographs, *Arch. Phys. Med.* 29:121 (Jan.) 1948.

3. McBride, E. D.: Disability Evaluation, Principles of Treatment of Compensable Injuries, ed. 2, Philadelphia, J. B. Lippincott Company, 1942, p. 62.

4. DeLorme, T. L.: Restoration of Muscle Power by Heavy-Resistive Exercise, *J. Bone & Joint Surg.* 27:645 (Oct.) 1945.



tion and offers continual resistance throughout the movement, equal and opposite to the force being applied by the digit.

#### Description of the Device

The thumb ergograph is illustrated in figures 1 and 2. Figure 1 is taken from an angle which demonstrates the use of the instrument during the movement of opposition. The same ergograph may be used for the study of either the right or the left thumb.

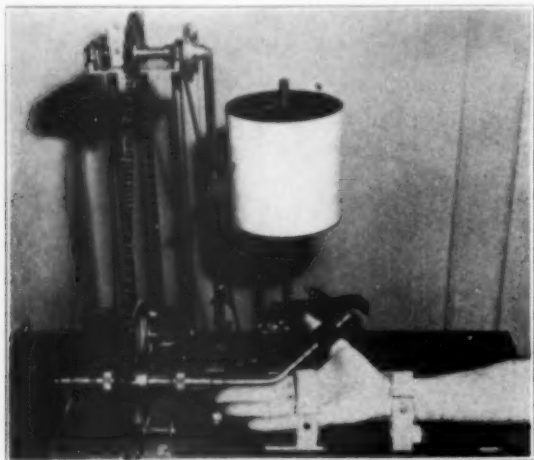


Fig. 1. — Thumb ergograph with the hand in position for the study of the functional capacity of the opposens.



Fig. 2. — Thumb ergograph with the hand in position for the study of flexion and abduction.



The forearm is supinated and strapped to a supporting platform. Only the hand and wrist must be firmly immobilized.

The portion of the axle attached to the wheel is in the same longitudinal plane as the carpometacarpal joint of the digit being tested and the shaft of the radius. The free end of the axle is bent at an angle which approximates that made by the thumb and the radius when the hand is held in the anatomic position. The proximal phalanx is applied against an adjustable concave thumbrest which revolves to conform with the changing position of the digit as it sweeps through the normal range of movement in opposition. Thus, the thumb and bent portion of the axle simultaneously describe cones of movement having a common base. The construction of the thumbrest makes it unnecessary to fix the digit to that portion of the axle to which force is being applied. The starting position of the axle may be adjusted to accommodate for any abnormality in the anatomical alignment of the thumb. This is accomplished by fixing only the central portion of the axle to the wheel and allowing the peripheral end bearing the thumbrest to be movable. The central portion of the axle is provided with a toothed collar which meshes with notches on a matching collar attached to the central end of the movable portion of the axle. Thus, the starting position may be exactly duplicated if desired or altered at will as malalignment is corrected.

The wheel consists of a standard bicycle sprocket. Fixed at one point to the periphery of the wheel is a bicycle chain which passes over a secondary sprocket, located on the load tower, to the shaft of the load carriage. As the wheel and axle rotate, the load carriage moves vertically. To prevent the load from swinging, the base of the carriage is perforated and slides on steel rods. The lead weights are slotted to fit the central shaft of the carriage.

An adjustable screw at the base of the load carriage makes contact with a standard microswitch in the circuit of an electromagnetic signal connected with a counter. Thus, the number of contractions performed during a bout of exercise is automatically indicated.

The sprocket on the load tower functions as a wheel which actuates a secondary axle. At the end of this axle a distance meter is so connected through gears that the height to which the load is lifted is indicated in centimeters. This is equal to the distance through which the thumb has moved. Grooved wheels of several different diameters are fixed to the opposite end of the axle. A linen thread passes from the periphery of the selected wheel to a frictionless carriage supporting an ink-writing capillary pen riding on a vertical rod. Thus, each stroke of the kymogram is directly proportional to the movement of the thumb and may be magnified or reduced as necessary for convenience of recording. Time is indicated by a simple chronograph. This consists of an ink-writing pen attached to a cam rotated by a 6 rpm synchronous motor. The contact pin may be made to ride on one of three wedged disks, recording time in 10, 30 or 60 seconds.

Figure 2 illustrates the use of the instrument for the study of thumb flexion and adduction, extension and abduction. The notched collar on the fixed central portion of the axle is disengaged from the peripheral end of the axle used for the study of opposition action. The collar is then united by a rod passing through the primary wheel to an identical collar on the opposite end of the fixed portion of the axle, which meshes with an adjustable crank against which force is applied during performance of the remaining movements of the thumb. The concave thumbrest rotates so as to maintain invariable contact with the anatomic part as it moves through its normal arc of motion. For the study of these movements the forearm and hand are supported in the midposition between pronation and supination.

#### Operational Instructions and the Technic of Application

The subject is seated on an adjustable stool; the wrist and metacarpophalangeal joints of the hand to be tested are strapped to the padded support. The axle carrying the thumbrest is adjusted to fit the angle and length of the digit. When thumb opposition is to be tested, the forearm is supinated and the index finger is aligned with and directly under the straight portion of the primary axle. During the testing of the thumb flexion-adduction and extension-abduction, the forearm is in the midposition with the distal portion of the extremity resting on the ulnar border of the hand.

Work capacity tests were performed as a two count exercise to the rhythm of an electrical visual-auditory metronome. The rate of working

ranged from 25 to 33 contractions a minute for opposition and was 33 and 29 for flexion and extension, respectively. This varies inversely with the length of the anatomic lever and the degree of motion, and thus it affects opposition more than it does the remaining movements. The load is lifted and lowered smoothly without rest pause at either the peak or the termination of the stroke. Most subjects adapted rapidly to the rhythm of the performance, so that no more than one or two preliminary bouts were required to master the technic. The load varied from 0 to 4.25 Kg. Two types of experiments were performed. In one the number of contractions in a single bout was the independent variable. The other was patterned after DeLorme's limit day procedure. The load was the independent variable. Repetitive bouts of 10 contractions each were performed against progressively increasing resistance. The load increment was 0.25 Kg., and a thirty second rest pause was allowed between successive bouts.

### Results and Their Interpretation

Evaluation of the instrument is based on 20 single bouts and 47 limit day procedures performed on 24 normal young adult subjects, 18 female and 6 male, and 5 adult patients, 4 of whom were male. All the clinical patients were suffering from the residual effects of poliomyelitis. One had a relatively recent transplant of the flexor digitorum sublimis to the opponens pollicis. In toto, 468 ergograms were collected.

Figure 3 illustrates the character of the ergograms obtained from single bout tests. These are satisfactory for exercise and disability evaluation purposes only if the load and rhythm of contraction are so adjusted, that the extent of maximal volitional shortening falls off progressively until the resisting weight can no longer be lifted (ergograms 3 and 4). In the first of the paired ergograms selected for demonstration the stress imposed was too light. This is evidenced by the appearance of a fatigue level. The experiment was arbitrarily terminated after the hundredth contraction. In general, steady state exercise of the type illustrated in the fatigue level portion of the first two ergograms is highly susceptible to variation of psychogenic origin. This renders it unsatisfactory for the training of either power or endurance and virtually without value for evaluation of disability.

Figure 4 illustrates the ergograms yielded by application of the limit day procedure. The progressive increase in stress prevents stereotyping and counteracts boredom. Computation of the work done per bout is illustrated in the single graph included in figure 5. This is a typical curve of work. It demonstrates that under the conditions of the experiment optimal functional capacity was elicited by a load of 1.5 Kg. Any stress beyond this point falls in the overload zone and is thus suitable for exercise aimed at development of strength.

The remaining curves in figure 5 illustrate that functional capacity tests of the limit day type are essentially repeatable and permit objective evaluation of the degree of disability when the handicap is unilateral. The subject of this experiment was a client undergoing vocational training (watch repairing) at the Woodrow Wilson Rehabilitation Center.

The various ergographic experiments conducted at the Medical College of Virginia during the last two years have been subjected to analysis for the purpose of studying the phenomenon of handedness. A curious fact of possible significance is the relatively high incidence of sinistral superiority in thumb strength, especially that of flexion. This is illustrated in the ergo-

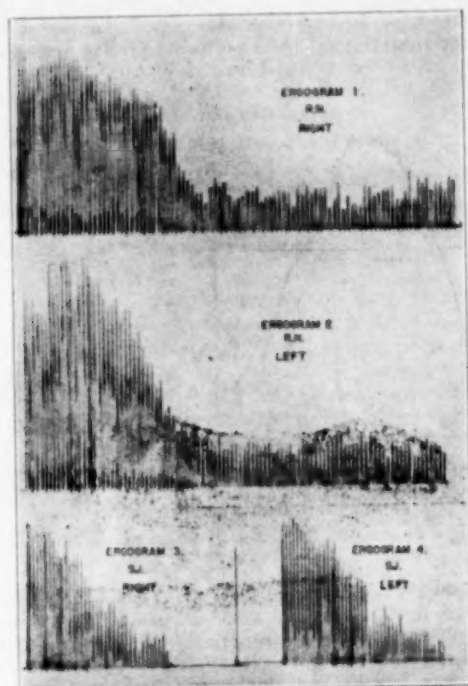


Fig. 3. -- Illustrative ergograms of two single bout thumb flexion work capacity tests. The load and rhythm are held constant. The number of contractions is the independent variable. R.N. (male) carried a load of 1.5 Kg.-M. Total work done on the right was 19.12 Kg.-M.; on the left, 18.56 Kg.-M. S.J. (female) carried a load of 1.75 Kg.-M. Complete fatigue occurred in thirty-nine contractions on the right and forty-five on the left during which 7.46 Kg.-M. and 8.35 Kg.-M. of work were done on the right and left sides, respectively.

grams of figure 3. Only 1 subject in the experimental group reported a preference for the left hand in the ordinary skills of daily living. Total work done by this subject on a right-sided standard limit day test (thumb flexion)

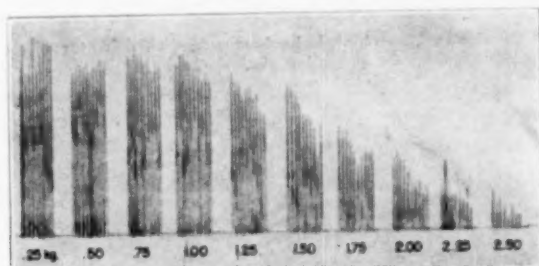


Fig. 4. -- Thumb flexion limit day procedure; left thumb, subject S.J. (female). Each stroke represents the maximal volitional contraction. The rhythm, number of contractions per bout and the rest pause between bouts are held constant. The initial load was 0.25 Kg. The load was increased by 0.25 Kg. in each successive bout until the requisite number of contractions could no longer be made in the prescribed rhythm.

exceeded the left by 22 per cent. The nonpreferred limb of all subjects, irrespective of handedness, is used invariably as the holding or supporting appendage, while the contralateral hand performs precise and dexterous move-

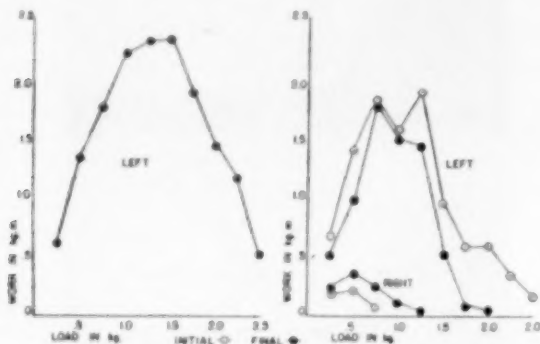


Fig. 5. — Graphic representation of work capacity tests made in accord with the standard limit day procedure. The single curve was constructed from the raw data presented in figure 4. This was obtained on a normal young adult subject. The remaining paired curves were obtained at an interval of one month on a young adult client of the State Division of Vocational Rehabilitation. His right-sided disability was due to the residuals of an infantile poliomyelitis.

ments. Thus, reasoning from first principles suggests that, when the thumb is tested, a reversal in dominance is to be expected if the criterion selected is dependent on staying power and strength. As might be expected, the combined movement of extension and abduction was significantly weaker than either flexion and adduction or opposition. Indeed, some of our subjects were unable to lift the lightest load placed on the carriage. Increments of less than 0.25 Kg. are desirable in the study of thumb extension by the limit day procedure.

#### Summary and Conclusions

A thumb ergograph is described and the technic of its use is presented. Preliminary trial on normal and on pathologic subjects indicates that this is a useful device for disability evaluation. The incidence of left thumbedness exceeds that of handedness sufficiently to suggest that this may bear a causal relation to differences in the functional use of the two hands in bimanual activities.

Our thanks are due Dr. Josephine J. Buchanan, Medical Director of the Woodrow Wilson Rehabilitation Center, for providing clinical cases.



## NEW DEVICES FOR DISABILITY EVALUATION\*

### 3. The Grip Ergograph

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and

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The ability to grasp and release is the single most useful function of the hand of man. It is a complex act, involving the coordinated response of a large number of muscles activating the multijointed levers of a structure unique in the perfection of its design. Disability of the thumb, a single digit, or the palm may affect the performance of the entire hand and, in turn, the functional capacity of the whole extremity. The importance of expediting functional restoration following injuries to the hand is, of course, well recognized.<sup>1</sup> Thompson found that 60 per cent of all industrial accidents incurred in Vauxhall Motors, Ltd., involved the hand<sup>2</sup> and considered a device developed to improve the grip as the most useful aid to the rehabilitation of those thus disabled.

The present paper is the third and last of a series concerned with the design and construction of valid and reliable tools for upper extremity disability evaluation. Without exception the instruments developed may be used for treatment, evaluation of progress and objective estimation of residual function when physical restoration is incomplete. The latter is of particular value in the rational and defensible adjudication of compensation claims.

#### Description of the Grip Ergograph

The principle of the grip ergograph differs from that of the devices thus far described.<sup>3</sup> The method of recording functional capacity and the technic of application are the same, but the force developed by the anatomic part under study is transmitted to a lever through a hydraulic system instead of a wheel and axle. The device is illustrated in figure 1. Bulbs of various size are attached to a stout flexible rubber hose connected to two sylphon type valve tops in parallel. These are fastened upside down to a base plate of heavy aluminum. A 30 pound pressure gauge is joined to the pipe linking the valve tops. Two stopcock valves allow water to be forced into the closed system and permit air to be released. Thus, if the bulb be squeezed, the sylphon bellows are compressed and the rod passing through the base of the larger inverted valve top elevates, activating a lever system provided with an adjustable fulcrum. A bicycle chain is fixed to the free end of the lever. This passes over a sprocket to the central rod of a suspended load carriage. The auxiliary devices used to indicate the number of movements and the distance to which the load has been lifted, and the method of recording stroke height and time are identical with those previously described. The entire ergograph is a self-contained, ink-writing unit that may be installed on any table of suitable height.

\* From the Division of Clinical Research, Baruch Center of Physical Medicine and Rehabilitation, Medical College of Virginia, and the Electrical Laboratory, School of Engineering, University of Wisconsin. This work was supported in part by the Office of Naval Research (Project NR 153 982). The ergograph was constructed by the late James Hipple, mechanic of the State of Wisconsin General Hospital.

1. Couch, J. H.: Treatment of Common Industrial Injuries, *Indust. Med. & Surg.* 18:373 (Sept.) 1949.

2. Thompson, A. R.: Engineering Methods in Occupational Therapy and Industrial Rehabilitation, *Indust. Med. & Surg.* 18:385 (Sept.) 1949.

3. Hellebrandt, F. A., and Skowland, H. V.: The Application of Ergography to Disability Evaluation: 1. The Normal Fatigue Curve, *Am. J. Occup. Therapy* 1:73 (April) 1947. Hellebrandt, F. A., Skowland, H. V., and Kelso, L. E. A.: New Devices for Disability Evaluation. I. Hand, Wrist, Radial-ulnar, Elbow and Shoulder Ergographs, *Arch. Phys. Med.* 29:21 (Jan.) 1948.

The smaller siphon type valve top is used to adjust the pressure within the system. In operation, water is forced into the hose, bulb, connecting pipe and air space of both tops until the bellows are about half compressed. After the desired load has been

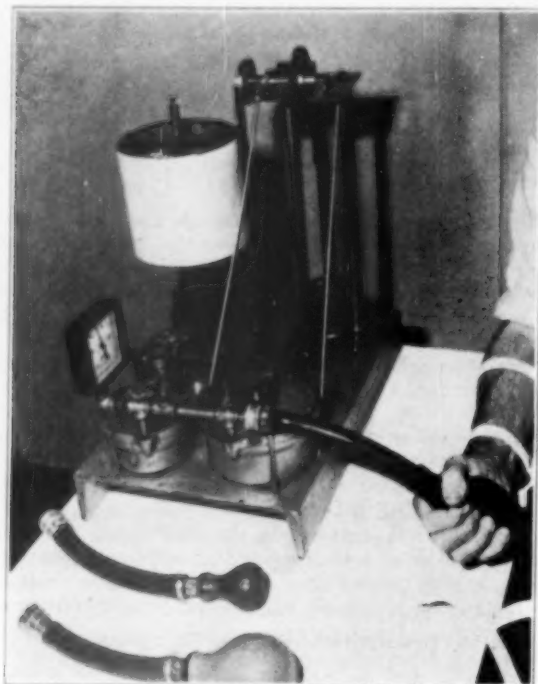


Fig. 1.—Photograph of the grip ergograph.

added to the carriage, the screw of the adjusting valve is turned until the lever has lifted the load slightly. The pressure gauge provides a rough visual index of the magnitude of the squeezing effort, and is used only to motivate the subject.

#### Evaluation of the Instrument

A large number of preliminary trials were run on 3 normal young adult subjects, 2 women and 1 man. Included in these were 204 ergograms obtained in 28 limit day tests designed to measure the influence of varying the size of the bulb, the position of the lever fulcrum and the pressure within the system. After all procedures had been standardized, the grip ergograph was tried on 37 patients, both adult and children, all of whom gave a history of hand weakness. The following disabilities were included in the group assayed: finger amputation, finger, hand or wrist fracture, burn, arthritis, poliomyelitis, hemiplegia, quadriplegia, multiple sclerosis, myasthenia gravis and traumatic lesions of the hand, forearm or brachial plexus. Most of the clinical patients were subjected to single limit day tests designed to evaluate grip capacity. The rhythm was held constant for any given subject, and ranged from 26 to 28 contractions per minute. The number of contractions per bout were usually either 25 or 30. At times they were reduced to 10, depending on the magnitude of the hand weakness and the age of the subject. The

attention span of children is too short to obtain an all-out volitional effort if the repetitive exercise is protracted. The load lifted was the independent variable. This was increased progressively with each successive bout until the requisite number of contractions could no longer be performed at the prescribed rhythm. The usual load increment was 0.25 Kg. This was increased to 0.5 Kg. when testing male subjects accustomed to hard work and capable of exerting considerable grip pressure. The rest pause between bouts was thirty seconds. In a few clinical cases, opportunity was offered to use the grip ergograph as a rehabilitation device.

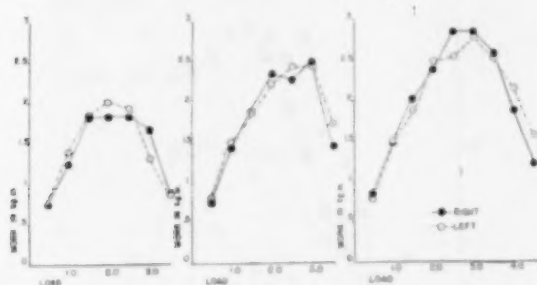


Fig. 2.--The response of a normal subject to repetition of the limit day procedure. This was administered three times in seven days with two days intervening between successive tests. The number of repetitive contractions per hour, rhythm, load increment per bout and rest pause between bouts were constant. The final load carried the requisite number of times in the prescribed rhythm was the independent variable. Work done per hour was computed by multiplying the total distance traversed by the load by its weight.

Figure 2 illustrates the improvement in the work capacity of a normal subject on three trials in one week with two days intervening. There is a striking and rapid improvement in power and endurance. The optimum load increased from 1 to 1.5 Kg. Staying power improved 28.57 per cent. Total work was augmented by 81 per cent. These findings may be attributed to the fact that a significant proportion of the daily assignment was carried out in the overload zone. It is of interest to note that the total work done by the left hand slightly exceeded that of the right in every trial. The subject of these experiments is right handed, and in extensive observations on the wrist ergograph had demonstrated dextral superiority of mild degree in all but one trial. We have already called attention to the high incidence of sinistral dominance in thumb strength<sup>4</sup> and have suggested that this may be due to use of the nonpreferred limb for support and holding in bimanual activities.

Figure 3 illustrates the initial disability and improvement under treatment of a patient who had sustained extensive laceration and contusion of the left forearm with fracture of the second metacarpal in an industrial accident. When first seen he had been under physical treatment for six months and had made what was considered to be excellent progress. Radioulnar and wrist function, which had been seriously impaired, were essentially normal. He was considered ready for discharge and had been sent to the

<sup>4</sup> Hellebrandt, F. A.; Kelso, L. E. A.; Houtz, S. J., and Edsall, R. N.: The Thumb Ergograph. *Arch. Phys. Med.*, this issue, p. 809.

clinical research laboratory for objective data to assist in the adjudication of a compensation claim. While the testing was in progress, incidental observations were made using the grip ergograph as a training device. Two limit day work capacity tests were performed and the patient exercised four

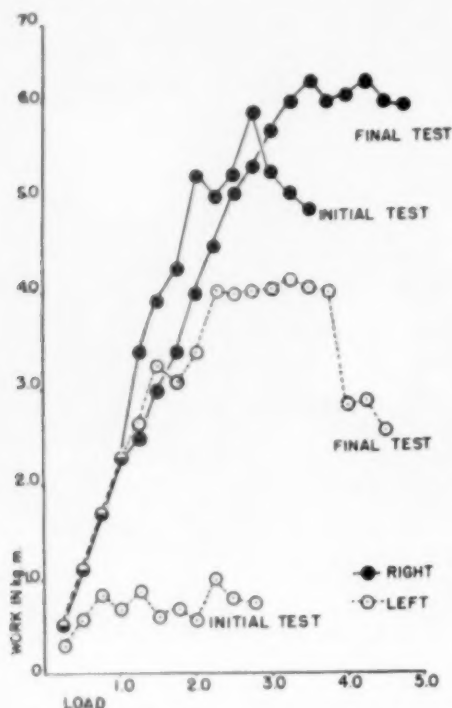


Fig. 3. — Work capacity tests demonstrating initial status, progress under treatment and the magnitude of the residual disability.

times in the intervening interval. Exercise consisted of 10 bouts of 25 repetitive contractions each, or 250 contractions per treatment period, all of which were in the overload zone.

The fatigue curves of the four exercise periods are presented in figure 4. On the second exercise day, 6 bouts consisting of 150 repetitive contractions were performed carrying a load exceeding the maximum lifted during the initial limit day procedure. The good effect of the short and incidental treatment program is obvious. When last seen, the functional capacity of the disabled hand was 73 per cent of the contralateral uninvolved extremity. Thus a significant proportion of the initial disability had been alleviated in twelve days.

Because of limitation in the range of movement at the extreme of finger flexion, all the ergographic work thus far described was performed with use of a large bulb. To throw further light on the magnitude of the major residual disability, a single work bout was performed on the last test day, applying grip force against a small bulb. This demonstrated a functional capacity of



the left hand equivalent to only 29.64 per cent of the right. Although progressive resistance exercise with the small bulb was recommended, the case was settled and the patient was denied further treatment. The evidence accumulated indicates that the end point of effective therapy had not been reached at the time of discharge.

Figure 5 illustrates two additional progress records on patients suffering similar injuries consisting of fracture of the index finger of one hand. Neither

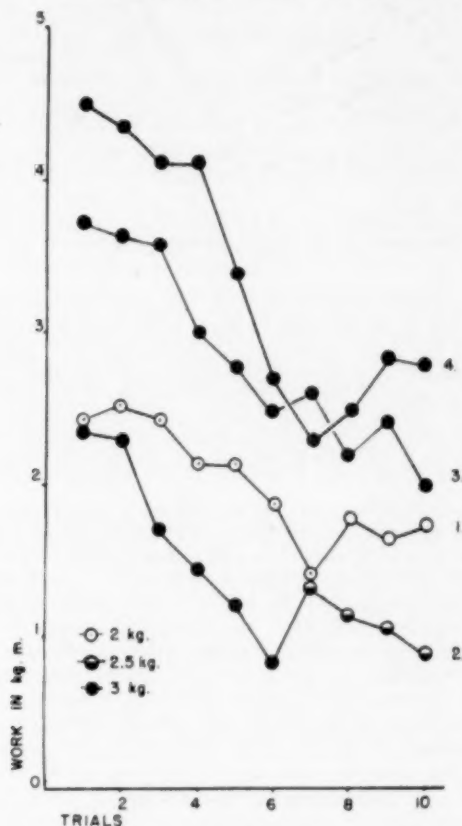


Fig. 4. — Fatigue curves produced by ten bouts of 25 repetitive contractions performed on four different days. The patient was suffering from residual hand weakness following a severe lacerating wound to the forearm. The influence of this treatment program on work capacity is illustrated in figure 2.

patient received treatment on the grip ergograph. Both were receiving routine treatment in the physical medicine department. One improved by 54.34 per cent in the four days intervening between the two test periods. The other demonstrated an augmentation in work capacity of 122.14 per cent in seventeen days.

The degree of disability may be estimated from comparison of the total work done on the involved and the contralateral side only if the test is carried

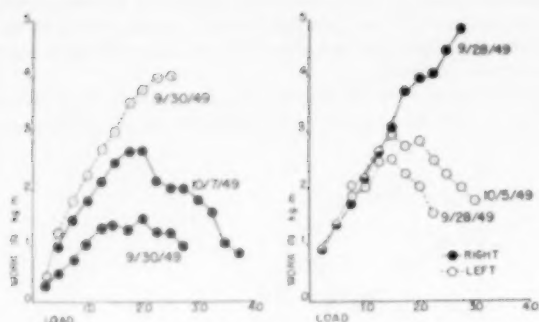


Fig. 3. — Work capacity tests illustrating the use of ergography for the measurement of progress under and the efficacy of another form of treatment. Both patients had sustained a fracture of the index finger of one hand.

out to complete exhaustion bilaterally. It may also be evaluated from the slope gradient of the ascending limb of the curve of work. In the majority of normal persons the work done in a constant number of contractions at a fixed rhythm increases uniformly on the right and left sides as the load is augmented. When the stress imposed approaches the optimal for the weaker of the homologous pair, differences in power become increasingly obvious. Thus, diminution of the angle separating the ascending limb of the work curve may be accepted as a sign indicative of the resumption of increasingly normal functional behavior.

Imperfect as these records are, they contain a wealth of useful information when interpreted physiologically. The last two illustrations demonstrate the general technic whereby ergography may be used to evaluate the efficacy of other forms of treatment. Both patients were receiving good physical therapy administered by an experienced therapist interested in the progress of the patient. The evidence suggests that the slope gradient of the progress curve exceeds that attributable to the gain anticipated from simple repetition of a test which is in itself a form of treatment. Precise delimitation of the improvement due to each of the two variables would require careful designing of the experimental procedure and the subjection of data to statistical treatment.

#### Summary and Conclusions

The last of a series of upper extremity ergographs is described. The technic of application is presented. The evidence suggests that the grip ergograph is a useful device in the management of a large variety of clinical conditions associated with hand weakness. Illustrative records are reviewed. They demonstrate that ergography may be used to assay the initial status of the patient, measure progress under treatment, determine the end point of effective therapy and evaluate the magnitude of residual disability. The values of ergography in the adjudication of compensation claims and the appraisal of therapeutic methods are discussed. Finally, attention is drawn to the fact that the ergograph serves a dual purpose, being equally efficacious as a mensuration and as a therapeutic device.

The cooperation of Mrs. Julia Britton, physical therapist at St. Philip's Hospital, is gratefully acknowledged.

## INTENSIVE GRADUATED EXERCISES IN EARLY INFANTILE PARALYSIS\*

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There is much room for improvement in the present method of enhancing and speeding up muscle recovery in infantile paralysis.

Progressive resistance exercises as described by De Lorme<sup>1</sup> and De Lorme and Watkins<sup>2</sup> hold out a promise in this direction. De Lorme, Schwab and Watkins<sup>3</sup> and, more recently still, Krusen<sup>4</sup> have shown that this technic will rapidly increase muscle power of a quadriceps group weakened by poliomyelitis.

In both reports it is stated that fatiguing the affected muscle does not seem to have had a delaying influence on the increase in muscle strength. But both reports have been concerned with the attempt to increase power in the unaffected muscle fibers. The earliest group in Krusen's report was observed, on an average, eight months after onset, while the 27 quadriceps muscles reported on by De Lorme, Schwab and Watkins were observed from one to forty-nine years after onset of poliomyelitis.

The present study, which has been conducted independently, and at about the same time, represents a somewhat different approach, to investigate the effect of intensive exercise on muscle strength in the early stages of infantile paralysis.

In this disease one is dealing at the onset with three types of anterior horn cells: destroyed, normal and damaged cells. It is the third group which is of most interest. Damaged anterior horn cells are numerous on all sections in which destruction was not overwhelming. One can get one clinical measure of the importance of this group if one remembers how extensive is the tendency toward spontaneous recovery of paralyzed muscles in this disease.

Some of the contradictory statements and observations made in regard to therapy of poliomyelitic muscles lie, I think, in the fact that the existence of this third (damaged) group has not been considered. With stimulating exercise, remaining healthy muscle fibers will increase in strength. The muscle, therefore, will show improvement under a procedure which, on the other hand, may well damage the muscle-nerve fibers which have been affected. Fatigue will do no harm to normal fibers. The normal part of a muscle will improve, even if the affected part should be damaged, or even destroyed, by such a procedure. If weak muscles are subjected to exercises which for their level of strength are exhausting, without provision at the same time for sufficient stimulation for the healthy fibers, then total muscle strength will decrease. This observation can be confirmed easily clinically. This consideration has led to the cautious attitude of attempting to avoid fatiguing a muscle, giving it very little exercise, thus most likely undertreat-

\* Read at the Twenty-Seventh Annual Session of the American Congress of Physical Medicine, Cincinnati, Sept. 9, 1949.

<sup>1</sup> From the former Poliomyelitis Service of the Knickerbocker Hospital, Director, Dr. Philip M. Stimson. Surg. 57:648 (Oct.) 1946.

<sup>2</sup> De Lorme, T. L., and Watkins, A. L.: Technics of Progressive Resistance Exercises. Arch. Phys. Med. 29:263 (May) 1948.

<sup>3</sup> De Lorme, T. L.; Schwab, R. S., and Watkins, A. L.: The Response of the Quadriceps Femoris to Progressive Resistance Exercises in Poliomyelitis Patients. J. Bone & Joint Surg. 30:934 (Oct.) 1948.

<sup>4</sup> Krusen, F. M., Jr.: Functional Improvement Produced by Resistive Exercises of Quadriceps Muscles Affected by Poliomyelitis. Arch. Phys. Medicine 30:271 (May) 1949.

ing it and prolonging illness and hospital stay. On the other hand, this approach probably has the advantage of allowing the damaged nerve-muscle fibers to recover, especially as it is never too late to provide the necessary stimulation to the unaffected fibers.

The advocates of early unrestricted or forced exercises have concentrated on the surviving healthy fibers. In strengthening them, they have possibly concealed any bad effect on the damaged ones. This may be unimportant in relatively strong muscles. But, if one wants to develop the last ounce of strength in a muscle which otherwise would be below functional level, this consideration becomes important.

With these thoughts in mind, I have tried to develop a practical method of avoiding exhaustion and at the same time providing maximum stimulation for increase of muscle strength.

It is difficult to provide objective proof of the value of any treatment approach in infantile paralysis. The tendency toward recovery varies widely, and prognostic criteria are valid only in broad outlines. Exceptions to established rules are numerous. Large, well controlled, uniformly recorded series are needed to make certain that any treatment approach represents a real improvement of the final outcome as compared to the possible outcome of a particular case without treatment or with another type of treatment. I am therefore very conscious of the limited value of a small series of cases in proving the efficacy of my approach.

In order to make the group more significant, I could not quite take our cases at random. Muscles were chosen which, in the course of about three months after onset, had shown no, or only little, tendency to improve. It was felt that if only little improvement could be demonstrated during the period, when, according to experience, tendency to improvement is greatest, then any change in the trend may be more significant.

My exercise technic follows closely the one described by De Lorme and Watkins. The effort was adjusted to the strength of the muscle or muscle group to be trained. In very weak muscles the movement was carried out either on the horizontal plane or with the assistance of gravity. Gradually with increasing strength the plane could be tilted uphill by positioning the patient with the help of increasing numbers of pillows, sandbags and plywood boards.

Weights and pulleys also used were for assisting and resisting movements. But at all times care was taken that the patient was able to set up his exercises independently, on his own bed, without help, except occasionally by his fellow patients.

An attempt was made to standardize each performance as much as possible. The patient was taught at what stage of performance he was to consider the fatigue point reached. When an exercise frequency of 20 to 30 was reached the exercise load was increased, as too frequent repetitions of the same movement tend to become boring and are apt to prevent the patient from carrying the exercise through to the limit of his strength. Very soon after the start it became apparent that both endurance and muscle strength showed a rapid tendency to increase. Changes of the setup had to be made every few days, requiring a good deal of ingenuity on the part of physical therapists.<sup>5</sup> But care had also to be taken not to increase the work load too rapidly. The tendency toward poorly coordinated movements and toward substitution of strong muscles for affected weak ones is ever present. On several occasions resistance had to be reduced after too rapid increase, in

5. I am indebted to the entire team and especially to the head technician, Mrs. Freez and Miss Eastman, without whose cooperation and ingenuity this work could not have been carried out.

order to reestablish the correct coordination. Exercise speed was regulated by a metronome. Each patient was made to keep a record of his performance, putting down the number of repetitions he was able to accomplish and any changes in his exercise setup.

At the onset my colleagues and I tried to determine the time required for a muscle to recover, after it had been exercised to fatigue level. It was found that invariably after a ten to fifteen minute interval the muscle strength had returned completely.

After this fact was established the number of sessions of intensive exercises was determined by practical considerations. In the first months of infantile paralysis the patient's schedule is apt to be very crowded with procedures to overcome pain, tightness and muscle weakness, rest periods, meals and necessary periods of leisure. It was found possible to have the patients do the prescribed exercises six to eight times daily, at intervals of not less than one hour.

We are conscious of the fact that fatigue levels of performance are not due purely to muscle weakness but are affected by psychologic factors as well. We found that enlisting our patient's cooperation and making his recovery dependent on an effort of his own, resulted in an improvement of morale in this patient group. Patients were only too eager to contribute to their recovery themselves instead of enduring, purely passively, treatment procedures and waiting impatiently for their release.

All patients were under our observation from a few days after onset of their disease, and all had received muscle reeducation once or twice daily prior to starting our intensive exercise program. This routine was also continued to all affected muscles other than those to which intensive exercises were instituted. In order to make sure that the routine of six to eight sessions daily was really carried out by the patients, the number of movements was limited to two at a time. When a rating of 4, or "good," was reached, a change was usually made to another movement. Conventional rating of muscles or movements according to the muscle chart of the Infantile Paralysis Foundation were used constantly. The grading was carried out by the same physical therapist, well trained in muscle testing. The tendency was to be conservative and to undergrade rather than overgrade a muscle.

As mentioned before, I have tried to increase the significance of our findings by concentrating on muscles which during the first three months after onset showed only a small degree of recovery under the routine treatment. In an attempt to get a further measure of control of our findings, I took from the 250 odd records of the poliomyelitis service, those of patients who were in the same age group, who had received the same treatment in all respects except for the intensive exercises given to the first group, who were observed from the onset of their disease and for the same minimum length of time and who had had muscle tests within four weeks, three months and four months after onset. They also had to have approximately the same muscles involved as the first group, and these muscles had to show a good tendency toward improvement. We excluded muscles which we knew from experience had little chance of recovery, such as initially very weak ones or scattered ones in otherwise completely paralyzed extremities. Thirteen records conformed to the stated criteria. From this group we selected 36 muscles. I feel that with this selection, the control, in spite of its small size, was made more significant.

Out of 74 records of intensive exercises from 21 patients, we found 32 records from 13 patients usable for this report. In the others, the patients

had either not been observed from the onset of their illness or not for a sufficient length of time or else the records had not been kept sufficiently conscientiously.

Table 1 shows the key which was used for the statistical evaluation as it compares with commonly employed muscle gradings. The plus and minus system most frequently employed does not lend itself to statistical work-up. The decimal system used here seems to me also to have the advantage that it conforms with the percentage evaluation of the muscle, while at the same time the testing method recommended by the National Foundation for Infantile Paralysis is used.

TABLE 1.—Comparison of Commonly Used Gradings with the Key Used in Our Statistics.

%	Lowett	N.F.I.P.*	Present Study
0	0	0	0
5	Trace	1	.5
10	Poor—	2—	1
20	Poor	2	2
30	Poor+	2+	3
40	Fair—	3—	4
50	Fair	3	5
60	Fair+	3+	6
70	Good—	4—	7
80	Good	4	8
90	Good+	4+	9
100	Normal	5	10

\* National Foundation for Infantile Paralysis, Inc.

TABLE 2.—Comparison of Two Groups During Period of Identical Treatment.\*

Group	Number of Patients	Number of Exercises	Muscle Grading at Onset	Muscle Grading After Days		Increase	
				Grade		Absolute	%
Intensive exercise	13	32	3.08	100	4.17	1.05	35.4
Control	14	36	3.89	96	7.14	3.25	83.5

\* It can be noted that the improvement of muscle strength in group 1 is considerably smaller than in the control group.

TABLE 3.—Comparison of Two Groups During the Period of Intensive Exercise.\*

Group	Muscle Grading at Start of Intensive Exercises	Muscle Grading		Increase	
		After Days	Grade	Absolute	%
Intensive exercise	4.17	33	6.28	2.11	50.6
Control	7.14	42	7.80	.66	9.2

\* It can be noted that the picture of improvement has now been reversed. The intensive exercise group shows a considerable spurt in muscle strength, whereas the control group has continued to improve on the much reduced scale.

The chart presents in graphic form the information expressed in tables 1 and 2. It demonstrates to what extent the tendency toward improvement had changed at the moment the intensive exercises were started. The ages of the patients in the two groups varied between 1 and 37 years, with averages of 18 and 19 years, respectively. The time which was required to get a reliable muscle test for both groups averaged 15.5 days after onset.

As can be seen, the initial strength of the control group was higher than that of the exercise group. The control group improved 83.5 per cent over the the initial rating in an average of ninety-six days, whereas the muscles of the intensive exercise group improved only 35.4 per cent over their initial rating before intensive exercises were started. Actually, in customary terms,

the improvement of the control group was from near 3 minus initially to a little better than 4 minus, or "good minus," whereas the improvement of the exercise group was from 2 plus or "poor plus" to just better than 3 minus. As can be seen from the chart, one is obviously dealing in the two groups, with unequal tendencies toward recovery, being better in the control group. But when the shapes of the two curves after the intensive exercises have been started are compared, the change is quite striking. While the control group shows improvement on a diminished scale, 9.2 per cent further increase, the exercise group shows a sharp rise in its tendency to improve, 50.6 per cent.

All patients received moist heat in the form of baths or packs, stretching and muscle reeducation. In some instances, the intensive exercises increased incoordination; in others, pain was elicited or increased. But in no instance was it necessary to interrupt the exercises because of muscle ache. My clinical impression, while working on these observations, was a very favorable one. In most patients a practically immediate change in the trend of im-



Comparative improvement of two groups.

provement could be observed. The few accurate figures that I was able to collect substantiate this clinical impression, and for this reason I feel that our report is warranted. Actually the figures do not fully express the changes observed. The physical therapist doing the muscle grading sometimes felt that the grade had not changed, although a particular exercise could be performed several times more frequently than when the exercise had been started.

The Lovett method of grading is a rather crude and inaccurate one, but this method had to be used for the statistical survey because it was the method used for the control group and because it was not possible to translate into statistical terms the exact performance as given in numbers of contractions and weights or gravity used to assist or resist a given movement.

The exercise table described and built by De Lorme and Watkins<sup>3</sup> could be used to grade muscles and movements accurately. Though I have not seen it, it seems to be an ideal setup for exercises such as have been used on our subjects. However, it would appear to be practically impossible to have enough of these tables to enable every patient in a poliomyelitis ward to

exercise with its help six to eight times a day. By the time the patients were ready for discharge, I found one further advantage of my method: They were well trained in the principle of these exercises, and they had realized their importance by observing the rapid improvement on the records they kept for themselves. I found it, therefore, easier to have the same routine continued at home, with the amount of supervision which is now available for ambulant patients.

In studying a large number of charts of infantile paralysis patients, it becomes still more obvious than one knows from clinical impression, how wide spread the symptoms in this disease are and how many factors enter into the final outcome of a given picture. The number of patients for a random survey, as advocated by the recent report,<sup>5</sup> must be very large indeed if the survey is to be of significance. In this disease one is faced with a goodly number of symptoms. For each of these symptoms several alternative treatments are under discussion. Therefore, the number of problems requiring clinical study is so great that one may have to be content with smaller groups, selected more pointedly, in relation to the question to be studied, as I have done in this paper. On the other hand, the emphasis on standard records and on objective, disinterested testing by outside observers, as advocated in this report, would help greatly to increase the validity of the various observations.

### Summary

A method of intensive exercises in early infantile paralysis has been outlined.

Results of 32 intensive exercises done by 13 patients are reported and compared with the results obtained with 36 more routine exercises done by 13 patients of a control group. It is strongly suggested that the muscles given the intensive exercises have shown greater improvement than could have been expected from the routine given to the control group.

5. Therapeutic Trials Committee. Methods of Clinical Study and Evaluation of Therapeutic Agents in Poliomyelitis. J. A. M. A. 140:524 (June 11) 1949.

The discussion of this article will appear in a later issue of the ARCHIVES.





## ACCIDENTS IN PHYSICAL MEDICINE \*

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NEW YORK

It is axiomatic in the use of physical agents for treatment purposes that any physical measure that cannot do any harm cannot do any good; vice versa, any measure that can do good can do harm. Harm may come through unavoidable accidents or through improper practice, and at times it is hard to draw the line between these two factors. The physician is responsible at all times for the safe technic of application of treatment measures by himself and his office aids. Considering the widespread use of physical therapeutic devices and procedures, there is an almost negligible amount of injury caused by them. Nevertheless, accidents unavoidably occur from time to time. Malpractice suits are based on alleged negligence, carelessness, want of requisite skill and poor judgment. An accident, if it be merely an accident and not the result of any neglect or improper act or neglect, does not form the basis of liability. The statement of a patient or his lawyers that when he went to the physician he was all right and then came away with a burn does not prove anything against the doctor. It must be shown that the latter has done something that is negligent, and the patient must have been free from contributory negligence before liability can be established.

I shall present the subject of accidents in physical medicine under three main headings: (1) general causes, (2) forms of injuries, (3) prevention.

### General Causes of Accidents

It is evident that any physician employing a piece of apparatus or any other therapeutic measure must have a clear conception of how to employ it efficiently and safely, and he must impress his patients to that effect, not by words only but by actual performance. The paramount question in determining liability in any case of alleged malpractice will always be, "Did the patient receive treatment according to the accepted rules of technic?"

The causes that lead to accidental injuries may be classified in three broad groups: (1) the equation of the operator — improper technic or inattention; (2) the equation of the patient — unusual sensitiveness or idiosyncrasy, lack of cooperation, contributory negligence; (3) the equation of apparatus and accessories — faulty construction or mechanical breakdown.

Many injuries are attributable to an unfortunate combination of causes; as long as the general rules of safe technic are followed, a single cause usually does not lead to any serious injury.

### Forms of Injuries

From a practical standpoint, accidental injuries in the practice of physical medicine can be grouped as burns, mechanical injuries and electric shock.

Unquestionably, the largest number of injuries occurring during physical therapy are burns of various sorts. A recent statistical survey<sup>1</sup> of cases in which court action occurred in the wake of the use of physical agents, shows that out of 91 cases there were 85 cases of burns; of these the majority were caused by hot water bottles; electric pads and diathermy apparatus ranged second and infrared generators, and various forms of conductive heaters (hot stoves, hot iron or hot lids), third.

\* Read at the Twenty-Seventh Annual Session of the American Congress of Physical Medicine, Cincinnati, Sept. 7, 1949.

*Court Actions in Use of Physical Agents (1916 to 1926)*

Hot water bottle	44
Electric pads	12
Diathermy	12
Infrared lamps (one explosion of bulb)	5
Hot stove, iron or lid	4
Heat cabinet	1
Hot douche	1
Electrosurgery	1
Cautery	2
Ultraviolet	3
Copper iontransfer	1
Massage	2
Manipulation	1
Cold	1
Fall of heat lamp	1
Total	91

1. Kovács, R. Medicolegal Aspects of Physical Therapy, *Rocky Mountain Law Review* 18:295, 1946; Appendix I (Stuart Miss Mamer): American Authorities Dealing with the Liabilities in the Practice of Physical Medicine.

Review of the medicolegal abstracts published in the *Journal of the American Medical Association* during 1943-1949 shows court actions in cases of burns: hot water bottle 4, diathermy 1, electrosurgery 1, explosion of heat bulb 1, fracture after electroshock treatment, 1.

### Burns

Burns are caused by an excess amount of thermal, electrochemical or photochemical energy. Their common feature is that they are due to the devitalization or destruction of tissue; that their appearance may vary from a passing erythema to blistering of superficial layers of the skin or deep tissue coagulation with subsequent ulcer formation; that they are slow of healing, may become infected and, according to the depth and the location of destruction, may be followed at times by unsightly scarring.

Burns from hot water bottles usually occur in patients who are unconscious and semiconscious in bed after operation. Hence they are not part of the ordinary routine of physical therapy. Since there is no warning signal the patients can perceive or give, the exposure to heat is much prolonged, and in case of excess heating there is much more damage to the skin and in underlying tissues. In mild overexposure there may be only an extensive erythema; usually, however, there are multiple blisters which break down in many instances and may result in painful ulcerations and later in extensive scars.

Exposure to infrared or visible radiation results normally in an erythematous response consisting of single dark red spots or a confluent network of these and occurs according to the distance from the lamp, the wattage of the bulb, the type of reflector and the sensitivity of the patient. Excess radiation or hypersensitivity may produce, after the initial erythema, wheal formation, local edema and eventually blistering. Sometimes these blisters only develop overnight. Excess radiation in normal persons usually gives a warning in the form of a burning sensation. There are quite a few persons who, when receiving treatment for the first time, think, in spite of warning to the contrary, that a severe burning sensation is part of an effective treatment and become blistered because of their own contributory negligence.

Diathermy burns are due to an excess amount of high frequency energy—long wave, short wave or microwave diathermy; their appearance and further course depends on the length of the excess current flow and the reaction

of the patient. There may be only a small erythematous area, similar to a second degree sunburn, which persists for a few days and ends in fading and peeling off, leaving no trace of a lesion. In patients with a marked exudative diathesis a large wheal may appear immediately or a few hours later over an overheated area only to disappear by next morning almost entirely or leave only a small erythematous area or perhaps a small blister. In certain instances, however, there is subsequent sloughing and ulceration, possibly with exposure of subcutaneous tissues, of muscles, even of bone. Such lesions were seen in the early days of long wave diathermy when neophytes bandaged a metal plate tightly over a flat bone surface, such as the frontal sinus. The advent of short wave diathermy with its simplified and safer technic of spaced condenser electrodes or the induction coil has done away with most of the burns due to direct metal contact. A not too rare form of diathermic overdosage is fat coagulation in the subcutaneous tissue, usually occurring in adipose women. In these cases, one or more painful nodules appear under the skin; however, they usually decrease and absorb in a few weeks without any further damage or permanent sign.

Electrochemical burns come about in galvanic treatment or ion transfer with electrophoretic drugs if the bare metal electrode or any corner of it comes into contact with the skin, or if the pad is too thin or not sufficiently wet or if there is a rent in the wrappings for ion transfer or a scratch in the skin. They are due to direct chemical action from either pole through the metal plate or due to excess density of the current itself. Galvanic burns develop often without a sensation of excess burning or pain owing to the small amount of current employed. After removal of the electrode or the wrappings for ion transfer only an excessive erythema over a small area or a slight wheal formation may show; both of these may last several hours and disappear next day. In the next degree of damage there may be blister formation of varying size and shape; these blisters may be single or confluent and are usually painless. In most cases they dry up, forming a scar which usually persists for some time and may leave only a slight change in the skin texture. Only when secondary infection occurs do slowly healing ulcers develop.

Photochemical burns due to ultraviolet radiation differ from other burns, inasmuch as, first of all, a mild degree of "sunburn" is a normal and desired reaction of the average treatment with ultraviolet rays; second, hypersensitivity plays a definite role in the occurrence of these burns when they are not due to overdosage. The results of an increased reaction in such cases vary all the way from a severe itching to a rapidly developing dermatitis, edema of the skin, formation of bullae, fever and general malaise. Overdosage in normal persons occurs when the operator forgets to turn off the ultraviolet lamp in time or a patient falls asleep under a self-administered lamp treatment. The severe general reaction in each case is due to the flooding of the blood stream with the split protein products of the skin, a severe "protein shock." In extreme cases, gastric and duodenal ulcerations may also occur, with a lethal outcome. Fortunately, in the course of ordinary treatments, severe reactions are extremely rare because it has been estimated that a margin of safety as great as 50 per cent against overdosage exists.

Treatment of burns occurring during electrical treatment is similar to that of any other burn. After antiseptic cleansing, the first dressing is made with a boric acid ointment. If on the next day the burn is found to be more or less dry and the surface of the skin is not broken a dusting powder with dry gauze held by adhesive plaster is all that is needed. When the burn is a

large one and ulcerated, use of the boric acid or triple dye dressing should be continued. Daily exposure to the rays of an infrared or incandescent lamp for one-half hour or more promotes nutrition and speeds up healing. The healing of small burns can also be speeded up by daily short exposures to ultraviolet irradiation. The burned areas may be kept dressed with plain gauze pads soaked in paraffin.

Diffuse dermatitis and systemic effects due to a severe ultraviolet reaction must be treated according to general medical principles.

### Mechanical Injuries

Injuries due to mechanical causes are much less frequent, as shown by only 4 cases in the table. Among the possible causes of such injuries are a poorly supported lamp or other piece of apparatus or a therapeutic bulb loosened in the socket which falls upon the patient, causing a contusion or skin tear. A patient may fall when, trying to get off a treatment table or when learning to walk with braces after prolonged bed rest with the result of anything from a contusion to a sprain or fracture. The excessive action of mechanical exercising apparatus equipped with a belt may cause injury to the skin or a rupture of such organs as the bladder. In colonic therapy the now outmoded long stiff colon tubes may cause a rupture of thin-walled diverticula. Manipulation of ankylosed joints may cause excessive reactions and at times fracture of atrophied bones. This is occurring nowadays occasionally in rehabilitation of paraplegics.

### Electric Shock

Electric shock denotes the sudden harmful influence of an electric current to the entire body. Serious shock can never occur during electrical treatments applied with a careful technic. Under rare conditions minor degrees of electrical shock may be caused by (a) low frequency current passing through the cardiac area; (b) accidental contact with a grounded object, and (c) transformer breakdown.

In use of low frequency currents even a small amount of current passing through the cardiac area may cause fibrillation of the heart and electric shock. This is the reason that shocks from an alternating current source are more dangerous than those from direct current. I<sup>2</sup> reported on a case of electrocution by a "violet" home treatment device when the patient, in an attempt to treat his back, plugged in the handle of the ultraviolet ray outfit and evidently wanted to increase the strength of the current by rigging a connection between a metal plate on the back of his neck and the radiator. Holding the ultraviolet ray electrode against his chest, no better way could be devised to conduct the alternating current from the return ground through the cardiac area, as proved by the cardiac changes shown by the autopsy. In another case wherein a hospital cardiac diathermy was prescribed, the two bare metal electrodes were connected by error to the alternating current outlets of a converter, causing instant death when the current was turned on.

As to accidental contact with a grounded object, touching a waterpipe, radiator, electric light socket while undergoing electric treatment from an apparatus or while immersed in a galvanic bath may cause shock. An apparatus which utilizes the commercial lighting current with interposition of only a variable resistance offers the possibility of leakage of ground current to a patient. Fortunately, shock caused by such occurrences becomes serious only if it affects a large surface of the body such as in an electric bath administered from an apparatus which is not "ground" free.

2. Kovács, R. Electrocution by Home Treatment Device. J. A. M. A. 149:198, 1942.

A very rare possibility for electric shock occurs if a therapeutic current is derived from a high tension transformer in a poorly constructed apparatus and during treatment a breakdown of insulation occurs between the primary and the secondary side of the transformer; there is danger of the high tension low frequency current jumping over to the patient.

In the new method of electric shock therapy a fairly mild current, less than 120 volts is being passed through the head. It was shown by Jetter<sup>2</sup> there are at least two mechanisms by which fatal circulatory failure may be precipitated. In the first, the tremendous muscle exertion of the convulsion may cause acute cardiac dilatation and failure. The danger of this undoubtedly bears a direct relation to the severity of already existing heart disease. In the second, circulatory failure occurs without recognizable heart disease and possibly results from electric stimulation of hyperexcitable central cardio-regulatory or vasomotor centers.

### Prevention of Accidents

1. *The Equation of the Operator.* — The operator of any piece of apparatus used for diagnosis and treatment must have a fair conception of its working mechanism and have full knowledge of the technic of its application. Such knowledge should be acquired on the basis of clinical instruction and experience and not from the salesman of the apparatus. The operator of any apparatus must know how the energy output of that apparatus is controlled and how it will affect the parts of the body subject to its influence. He must know how to proceed with the treatment to the degree of maximum efficiency without discomfort to the patient. He must be familiar with the danger signals of chemical or heat burns. He must take nothing for granted so far as the patient is concerned and use all reasonable precautions to avoid accidents, except that he may not need to foresee and to guard against injuries due to willful acts of neglect of the patient in disregarding properly understood warnings.

2. *Equation of the Patient.* — The physical and mental equation of the patient is of paramount importance in administering treatments. A safe technic in many instances depends upon the patient's cooperation in reporting at once an unpleasant sensation or a feeling of excessive heat or in keeping still in a certain position; if patients fail to comprehend or follow these instructions, their lack of attention or misunderstanding becomes a contributory factor in accidental injuries.

The individual skin sensitiveness to ultraviolet radiation in persons of fair complexion, blondes and old persons is well known and must always receive consideration. The maximum dose which such patients can safely tolerate can be determined only by preliminary testing over a small area of the skin.

3. *Equation of the Apparatus.* — Apparatus must be in good working order as an essential for the safe application of treatment. Accessories or apparatus used day by day are apt to get out of order through continued friction or wear, such as slow disintegration of insulation due to heat or through defective construction. Physicians should buy only apparatus of standard make and from a responsible manufacturer. Apparatus and accessories must be kept in good working order by regular frequent inspection and by immediate correction of any trouble, no matter how trivial.

2. Jetter, W. W.: Fatal Circulatory Failure Caused by Electric Shock Therapy, *Arch. Neurol. & Psychiat.* 34:567, 1944.

### General Precautions

No complaint of a patient during examination or treatment, no matter how trivial, should ever be lightly brushed aside. Proper technic requires that the patient be made comfortable and that he remain so during the entire treatment; that the part under treatment be well supported and relaxed; also, that in a busy office, a time clock or other controlling device be used to cut off the current automatically at the expiration of the treatment period.

It is an important rule of the routine of any office that the parts receiving treatment be carefully inspected before and after each application and that any changes be noted. One occasionally hears complaints made by patients that they noticed a blister on returning home after an electric treatment. If routine inspection of the parts after any treatment is consistently carried out and no changes are found in the office, one can safely assert that the lesion complained of did not originate from the treatment there for any damage to the skin from a galvanic, diathermic or other electric current would produce enough change in the tissues to be visible immediately rather than appearing for the first time hours afterward. Burns due to heat treatment by lamps, as a rule, show up immediately, also, but occasionally a blister may develop overnight, owing to a long exposure to heat. Burns after exposure to ultra-violet rays take twenty-four to seventy-two hours to develop fully. The chief protection of the operator in all cases is an indisputable record as to a generally correct technic.

The final point of safe technic is never to leave a patient out of sight or sound once the treatment has been started. Either the physician or his trained office assistants must be ready at all times to control the current strength, to shut it off altogether if the patient complains or there is any possible sign of danger and to give any needed assistance. There are devices available which are connected to the apparatus and which will shut off the current at the end of the treatment period. However, the patient should be able to summon help at any time in case of any discomfort. This can be best done by handing the patient a small bell or other audible signaling device.

It is bad psychology ever to discuss any trouble with apparatus before a patient. When receiving electrical treatment for the first time, patients are usually apprehensive, and any doubts expressed about the smooth working of the apparatus may arouse groundless fears causing them to jump or throw off electrodes at the slightest provocation with possible infliction of a burn. Unremitting vigilance is the price of preventing any mishap from becoming serious.



# ARCHIVES of PHYSICAL MEDICINE

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## .. EDITORIALS ..

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### PROPOSED INSTRUCTIONAL COURSE FOR 1950

The instructional course to be held during the meeting of the Congress in Boston, August 28 through September 1, 1950, will be divided into two sections, a plan similar to that which has been followed for the last several years. The number of subjects to be discussed in each group of lectures will be limited, so that each may be reviewed with reasonable thoroughness. One group of ten lectures will be on basic subjects. The proposed subjects for this group of ten lectures are as follows:

Two one-hour lectures will be devoted to anatomy of the brain and spinal cord. The lectures will be on salient points in neuroanatomy which may be of significance to physical medicine in its clinical application to neurologic lesions.

Two proposed lectures, on the pathologic physiology of the brain and spinal cord, with special reference to the types and localizations of lesions producing motor disturbances, may be of significance to physical medicine and rehabilitation.

There will be one lecture on the pathologic physiology of lesions of peripheral nerves, which will include the neuritides. It is hoped that much recent basic material will be presented during this lecture.

There will be two one-hour lectures on the physics of muscular action. These lectures are to be concerned primarily with the basic mechanics of muscular action, such as the introduction of force, energy, power and with the efficiency of measurement thereof. The lectures will be given by a physicist, and the material presented will be a little different from that which has been presented previously in these instructional courses.

There will be one lecture on the physiologic effects of heat, including a discussion of recent material on the physiologic effects of the various types of heat and the comparative efficiency of each type.

There will be two one-hour lectures on medical writings by one of the editors of the *Journal of the American Medical Association* which should be of great interest to any physician, and particularly to young physicians.

The second group of lectures will be primarily on subjects of a clinical nature.

Since there has been great interest in the development and use of hormones in the treatment of rheumatoid arthritis, two lectures will be given on the use of hormones in the treatment of rheumatoid arthritis.

There will be one lecture on physical medicine in rheumatoid arthritis, from the standpoint of new methods of treatment.

There will be one lecture on the clinical use and the dangers of micro-waves. In this lecture, much of the research material which has been presented in the last two years will be summarized.



There will be one lecture on analysis of pathologic gaits and gait training. This is intended to be basic and analytic, and not necessarily a discussion of crutch-walking.

There will be one lecture on resistive exercises in the treatment of poliomyelitis. There has been considerable investigation of such exercises in the last few years, and this lecture will constitute an opportunity to summarize and present new material on this subject.

There will be a lecture on the useful mechanical devices used in physical medicine and rehabilitation. It is understood that one center has been collecting such material, which should be of considerable interest to those practicing physical medicine and rehabilitation.

There will be a lecture on exercise in the treatment of asthma. It is true that there have been some contributions to the literature on this subject, but thus far there has not been an opportunity to summarize the findings.

The ninth lecture will be on the indications for orthopedic reconstruction in poliomyelitis. Although many papers are being produced on poliomyelitis, little has appeared lately, relatively speaking on the reconstruction phase of this disease. Such a review should be timely.

The tenth subject will be on disabilities of the shoulder, a subject which is always of especial interest to those practicing physical medicine.

Both groups of lectures are arranged primarily for physicians. However, as in the past, the clinical lectures will be open to therapists, if they wish to attend. Attendance of the group of lectures on basic subjects will be limited to physicians. Every effort is being made to select outstanding men in the various fields to give these lectures. A number of the lecturers selected have already accepted invitations to take part in the course.

#### 28th Annual Session

#### SCIENTIFIC EXHIBIT SPACE

Requests for applications for scientific exhibit space in connection with the 28th Annual Session to be held at the Hotel Statler, Boston, Massachusetts, August 28 to September 1, 1950, are being received. Address all communications to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2.



### Procedures for the Recruitment of Physical Therapists for Infantile Paralysis

Adopted by the American Physical Therapy Association and the National Foundation for Infantile Paralysis

**Recruitment.** — Physical therapists will be recruited for emergency work with infantile paralysis patients by the American Physical Therapy Association, 1790 Broadway, New York 19, N. Y., upon the request of National Foundation's state representatives or chapter chairmen.

The need for physical therapists should be determined by the health officer, the hospital administrator, a representative of National Foundation's local chapter, preferably the chairman of the medical advisory committee, and, wherever possible, a qualified physical therapist. A factor in determining the need is the daily case load of acute poliomyelitis per therapist. This should not exceed a number which, in the opinion of the physician in charge and the chief physical therapist, may be cared for adequately.

Responsibility for bringing the above-mentioned persons together to determine the need for physical therapists will be placed upon the local chapter of the National Foundation, acting in consultation with the state representative.

It is understood that all representatives of the National Foundation will also seek the advice and services of other agencies and organizations, such as the county medical society, district nurses' association, chapter of the American Physical Therapy Association and hospitals, when the local situation so indicates.

Where physical therapists are available locally and a need exists, the chapter and state representatives are urged to see that such personnel are employed by the hospital, provided they meet the qualifications (see *Qualifications* hereunder) and are employed according to the policies and procedures set forth herein, including the provision for basic monthly salary. In those instances, the American Physical Therapy Association must be informed as to the physical therapists' names, addresses and professional qualifications.

**Interpretation of Emergency.** — It is recommended, for organizational purposes, that an emergency physical therapy condition be considered to exist when the personnel required for the care of poliomyelitis patients cannot be obtained by the local hospitals and a request for assistance has been made.

**Qualifications.** — Only those physical therapists who have one or more of the following qualifications will be referred to temporary, emergency positions.

- a. A graduate of a physical therapy school approved by the Council on Medical Education and Hospitals of the American Medical Association.
- b. A member of the American Physical Therapy Association.
- c. A senior member of the American Registry of Physical Therapy Technicians.

**Employment.** — Physical therapists recruited by the American Physical Therapy Association for work with infantile paralysis patients are temporary employees of the hospital for which they are recruited. *Neither the American Physical Therapy Association nor the National Foundation employs physical therapists recruited for temporary work with infantile paralysis patients.* All temporary physical therapists are subject to the rules and regulations of the institution to which they are assigned.

The National Foundation's chapters are authorized to reimburse the hospital for the physical therapists' salaries.

Minimum length of employment — three months  
Maximum length of employment — six months.

In situations where employment beyond six months may be indicated, the National Foundation will not underwrite the cost of return transportation unless an official extension has been granted by the group responsible for determining the need for the physical therapists (see *Recruitment* above), and approved by the American Physical Therapy Association.

Since temporary physical therapists will be employed by the hospital, it is expected that the institution will extend to them those privileges of sick leave and state workmen's compensation which are extended to personnel employed regularly by that institution.

If physical therapists leave their assignments of their own accord before the completion of three months' service, they will be paid through the last day of service. If physical therapists are released by the hospital before the completion of three months' service, they will be given one week's prior notice or the equivalent amount of pay.

**Supervision.** — Where hospitals cannot provide a qualified physical therapy supervisor, the American Physical Therapy Association will recruit a physical therapist with supervisory experience and ability.

Physical therapists will not be sent to hospitals unless a physician is in charge to prescribe physical therapy treatments. Qualified physical therapists cannot be sent to work under the supervision of unqualified physical therapists.

Recent graduates or physical therapists with no experience in the care of infantile paralysis patients will be referred to hospitals where qualified experienced physical therapy supervision is available.

**Salary and Hours of Work.** — The following nationally uniform basic monthly salary schedule will be paid to all physical therapists recruited by the American Physical Therapy Association for the general duty hours prevailing in the hospitals to which they are assigned — but not less than 40 hours and not more than 48 hours duty per week:

- a. \$240.00 per month to new graduates who are accepting emergency poliomyelitis assignments as their first employment.
- b. \$260.00 per month to experienced staff physical therapists.
- c. \$285.00 per month to supervising physical therapists.
- d. Physical therapists recruited locally for part time work shall be paid a pro rated salary, based on the above classifications.

Payment of salaries will be made by the hospitals in accordance with the regular pay period for the professional staff in those hospitals, salary to start on the day the physical therapist reports to the hospital for duty. Hospitals have a legal responsibility to withhold tax on salary and maintenance of physical therapists and to report to the Government the full amount of wages (including salary and maintenance) and tax withheld. Hospitals should furnish withholding tax statements<sup>12</sup> for complete salary, maintenance and tax withheld to physical therapists at the termination of their services.

**Maintenance.** — Physical therapists recruited outside the community will receive maintenance, to include lodging, meals and laundry of uniforms, from the hospital, if at all possible. The National Foundation's chapters are authorized to reimburse the hospital for the actual cost of such maintenance but not to exceed \$75.00 per month. When maintenance cannot be provided by the hospital to physical therapists recruited outside the community, an allowance of \$75.00 per month, to be applied toward maintenance, will be paid to each physical therapist by the hospital as partial compensation for living away from home. National Foundation's chapters are authorized to reimburse the hospital for this monthly maintenance allowance.

In cases where living accommodations for physical therapists are not available in the hospital, accommodations in the community will be arranged for them in advance by the National Foundation's local chapter or the hospital administrator.

In those instances where lodging is available at the hospital but the physical therapist chooses to live outside, it may be done provided the physical therapist as-

sumes the responsibility of finding the accommodations. The physical therapist will be allowed a \$75.00 per month stipend, minus the cost of any meals or laundry furnished by the hospital. National Foundation's chapters are authorized to reimburse the hospital for this monthly allowance.

Physical therapists recruited to serve in their own community by the American Physical Therapy Association, or one of its component chapters, will pay for any meals or laundry received at the hospital, unless the hospital wishes to furnish such services without charge.

**Travel Expense.** — Travel expense from place of recruitment to place of assignment will be paid by the American Physical Therapy Association. Return transportation from place of assignment to place of recruitment will be paid by the American Physical Therapy Association to physical therapists whose length of employment does not exceed the period for which assignment was made. Such travel expense is to include: cost of plane, bus or train accommodations plus an allowance of \$10.00 per day (24 hours) while traveling in lieu of salary and expenses, such as meals enroute, taxis, tips, baggage costs, and purchase of travel insurance by the physical therapist. In addition, the cost of hotel room, if necessary between train, bus or plane, not to exceed \$4.00 per day, will be allowed.

If physical therapists travel to their assignments by car, the American Physical Therapy Association will pay expenses at the rate of 5c per mile. (This should not exceed expenses for travel by plane or train, whichever is greater.) When traveling by car, the allowance of \$10.00 per day (24 hours) plus hotel not to exceed \$4.00 per day will be allowed only for the same number of days necessary to reach destination by train. Expenses for additional time, because of preference of travel, are to be absorbed by the physical therapists.

The American Physical Therapy Association will be reimbursed for these travel expenses by the National Foundation.

Return transportation will not be paid to physical therapists who

- a. Leave of their own accord before the termination date of their assignment.
- b. Leave assignment for vacations, holidays, or any other unauthorized leaves.
- c. Remain beyond the termination date of their assignment, unless an extension of the assignment has been authorized by the American Physical Therapy Association.

## MEDICAL NEWS

### Personals

Dr. Frank H. Krusen, Head of the Section on Physical Medicine of the Mayo Clinic and Director of the Baruch Committee on Physical Medicine and Rehabilitation will deliver the Samuel Hyde Memorial Lecture before the Royal Society of Medicine, London, May 10. Other speaking engagements will include the British Association of Physical Medicine, the Danish Society of Physical Medicine, Society of Electrical Engineers, London, University of Dublin and the University of Edinburgh.

Three hundred friends paid tribute to Dr. George M. Piersol at a testimonial dinner at the Union League on February 2. A physician for more than fifty years, he is professor of medicine, University of Pennsylvania Graduate School of Medicine, professor of physical medicine and director of the Center for Instruction and Research in Physical Medicine at the University of Pennsylvania and active consultant in medicine at Philadelphia General Hospital. Among other positions he has been president of the American College of Physicians and of the Philadelphia County Medical Society. Portraits of Dr. Piersol were unveiled at the dinner, one being presented to the University of Pennsylvania and the other to Mrs. Piersol.

Doctor A. William Reggio, Chief, Physical Medicine and Rehabilitation Branch, Division of Hospitals, U. S. Public Health Service, was retired on February 1, 1950, after having reached the Service's mandatory retirement age (64). Currently, he holds the grade of Medical Director. His successor has not been named.

Before joining the Public Health Service in May of 1942, Doctor Reggio had been in private practice in Brookline, Massachusetts.

As a Commissioned Officer in the Public Health Service, Doctor Reggio was first assigned to the Office of Civilian Defense as Deputy Chief of Emergency Medical Service in Massachusetts. In 1944 he was called to Washington where he was assigned to the staff of the Medical Division, U. S. Office of Civilian Defense. Later he was detailed to the United Nations Relief and Rehabilitation Administration as Chief of the Medical Services and Supplies Section of the Health Division. In February of 1945 he assumed his present post which encompasses the physical medicine and rehabilitation programs of the nationwide system of Public Health Service hospitals and outpatient facilities.

Dr. William S. Tillett, professor of medicine, New York University College of Medicine, de-

livered the sixth Harvey Lecture of the current series at the New York Academy of Medicine March 16 on "Studies on the Enzymatic Lysis of Fibrin and Inflammatory Exudates by Products of Hemolytic Streptococci."

### Organize Physical Medicine and Rehabilitation Society in Chicago Area

Physiatrists in the Chicago area will meet Wednesday, April 19, to organize a society for those in this district who are interested in the field of physical medicine and rehabilitation.

### Eastern Sectional Meeting of Congress

Saturday, April 29, in the George Washington Hospital, Washington, D. C., the Eastern Sectional meeting of the Congress will be held. For complete details of the session, your attention is called to page 255, this issue of the ARCHIVES.

### Midwestern Sectional Meeting of Congress

Thursday, May 11, in the University Hospitals, State University of Iowa, Iowa City, the Midwestern Sectional meeting of the Congress will convene. For announcement please turn to page 197, this issue of the ARCHIVES.

### Physical Medicine at Bay City, Michigan

Wednesday, April 26, at the Wenonah Hotel, Bay City, Michigan, there will be presented a symposium on Physical Medicine and Rehabilitation. A complete program is detailed on page 253, this issue of the ARCHIVES.

### New York Society of Physical Medicine

The regular April, 1950, meeting of the New York Society of Physical Medicine will be held Wednesday, April 5, at the New York Academy of Medicine Building. A technical forum will be presented in which there will be discussed problems of physical medicine to cover physical therapy, occupational therapy and rehabilitation.

### New Jersey Society of Physical Medicine

Dr. A. M. Ornstein, Neurologist from Philadelphia was the guest speaker at the meeting March 29, of the New Jersey Society of Physical Medicine. His subject was "Neurological Orientation for Physical Medicine." The officers of the organization are Bror S. Troedsson, M.D., President, and James C. Hanrahan, M.D., Secretary.

### Course in Electromyography at University of Southern California

A two weeks course, from Feb. 6th to 18, in electromyography was presented by the staff of physical medicine at the University of Southern California. It included demonstrations, lectures and clinical practice in electromyography and electrodiagnosis. The course was given for physicians.

### Fellowships in Physical Medicine

The National Foundation for Infantile Paralysis is offering one to three year clinical fellowships in physical medicine to physicians who wish to prepare for certification by the American Board of Physical Medicine and Rehabilitation.

Eligibility requirements include United States citizenship, graduation from a class A school of medicine, completion of internship of not less than one year, license to practice medicine in one or more states and sound health. Fellowships are limited to those of 40 years of age or less.

Financial benefits are flexible and will be arranged according to individual needs. Candidates will be selected competitively by the Committee on Fellowships in Physical Medicine, composed of members of the profession certified by the American Board of Physical Medicine and Rehabilitation.

In accepting a fellowship each recipient must agree to practice as a specialist in physical medicine in the United States or its territories for a minimum of two years, and must have completed three years of clinical study. Both of these requirements are necessary to qualify for Board certification.

Additional information and applications may be obtained from Professional Education Division, The National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York.

### Appreciation

Mr. Basil O'Connor, President of the National Foundation for Infantile Paralysis, expresses appreciation by the following letter to all those who were helpful during the 1949 epidemic period:

The year 1949 brought with it the highest incidence of infantile paralysis on record in the United States. But the year 1949 also brought with it the deeply reassuring and heart-warming response of people in the unsparring service given by the professional personnel who cared for the stricken.

Hospital administrators, nurses, physical therapists, medical social workers, physicians and their many assistants — all were willing to make adjustments in their professional and personal lives to provide the watchful and expert care so necessary for the maximum recovery of polio patients.

I wish it were possible to thank personally, the many thousands of individuals who gave so unstintingly of their time and service. I am happy

indeed through this open letter to those who served, to express the gratitude of the National Foundation for Infantile Paralysis, as well as my own personal appreciation, for their service to infantile paralysis patients.

### VA News

The Veterans Administration has announced organizational changes in its Physical Medicine Rehabilitation Service placing greater medical emphasis on the rehabilitation aspects of the service.

Specifically the former Educational Therapy and Manual Arts Therapy sections in hospitals and centers have been placed under the administrative and professional supervision of the Chief of the Occupational Therapy Section.

Dr. Paul B. Magnuson, Chief Medical Director of the V-A, declared the move will "increase the efficacy of these rehabilitative therapies by providing administrative and professional supervision by a person (occupational therapist) with a background of clinical training."

The professional supervision by the Chief of Occupational Therapy will make available to the physician additional important information essential for the over-all treatment of the patient.

This realignment, V-A officials pointed out, does not alter the professional direction and responsibility of the physician in charge of Physical Medicine Rehabilitation at the hospital. Physical Therapy and Corrective Therapy sections continue reporting directly to the physician.

Manual Arts and Educational therapists will continue to utilize their professional technique heretofore for those patients whose illnesses require those particular types of therapy.

In addition to greater medical supervision the changes will eliminate duplication of therapeutic activities and permit more efficient assignment and scheduling of patients for these phases of their rehabilitation treatment. From an administrative standpoint elimination of unnecessary duplication of equipment, space and supplies can be expected, while a proper balance is maintained in staffing among the therapies.

The Occupational Therapy Section may be composed of three units, each headed by a qualified and trained therapist who will have more time to treat patients as a result of the change.

### Appoint New Dean at Illinois

Dr. Stanley W. Olson, assistant director of the Mayo Foundation, Rochester, Minn., has been appointed dean of the University of Illinois College of Medicine effective April 1, succeeding Dr. John B. Youmans, who has accepted the deanship of medicine at Vanderbilt University, Nashville, Tenn. Dr. Olson will assume his new position with rank of professor at the university's Chicago professional colleges and will serve as medical director of the university's research and educational hospitals. He has been a member of the staff of the Mayo Foundation since he was re-

leased from duty in the Army in 1946. Dr. Olson, who is 36 years of age, will be the youngest physician to hold the deanship of medicine at the University of Illinois.

### Poliomyelitis

The Southern California Society of Physical Medicine sponsored a symposium on the diagnosis and treatment of anterior poliomyelitis, March 20, at the Kabat-Kaiser Institute, Santa Monica, Calif. The speakers were:

- Albert G. Bower, M.D., Diagnosis and Treatment of Acute Anterior Poliomyelitis.
- O. Leonard Huddleston, M.D., Non-surgical Treatment of Anterior Poliomyelitis During the Convalescent and Chronic Stage.
- David Rubin, M.D., Presentation of Convalescent Anterior Poliomyelitis Patients.
- Richard Moore, M.D., Presentation of Chronic Anterior Poliomyelitis Patients.
- Dale Austin, D.S.C., Use of Foot Balancers in Ambulation and Gait Training of Anterior Poliomyelitis Patients.
- Theodore Stonehill, M.D., Preliminary Report on the Results of Treatment of Anterior Poliomyelitis Patients at the Kabat-Kaiser Institute for the Year 1949.

### Workshop on Poliomyelitis

A workshop on poliomyelitis will be offered by the Physical Therapy Department of the University of Southern California in affiliation with Los Angeles County General Hospital and Rancho Los Amigos during a Summer Session.

The course will be devoted to theory and to practical work in both the acute and convalescent phases of polio. Special emphasis will be placed upon the respirator patient with regard to physiology of respiration, positive and negative pressure and ventilation studies.

Practical work will include packing, muscle analysis, muscle examination and muscle reeducation procedures.

- Eligibility: Graduates of American Medical Association approved Schools of Physical Therapy
- Dates: July 5 through August 2, 1950
- Time: 6 days per week from 8:30-4
- Tuition: \$64.00
- Unit credit: 4 units (semester hours) to the properly qualified therapist
- For information relative to the course, write to: Miss Charlotte W. Anderson, Chm., Physical Therapy Department, University of Southern California, Los Angeles 7, California
- For information relative to scholarships, write to: National Foundation for Infantile Paralysis, Inc., 120 Broadway, New York 5, N. Y.

### National Rehabilitation Association

The Annual Regional Conference of the National Rehabilitation Association will be held on April 21, 1950, at the Narragansett Hotel in Providence, Rhode Island. The morning session will begin at 10 A.M. to consider three topics: Rehabilitation of the Blind; The Significance of Emotional Components in Disability; Problem of the Homebound. The program following luncheon will consist of two panel discussions: After Rehabilitation, Then What?; The Connecticut Rehabilitation Plan.

### British Rehabilitation Authority to Speak

Dr. T. M. Ling, noted English psychiatrist and medical rehabilitation authority, opened a tour of speaking engagements in this country with an address at the Institute of Physical Medicine and Rehabilitation of the New York University-Bellevue Medical Center on February 10. Dr. Ling spoke on the subject, "Rehabilitation in Great Britain." Dr. Ling is Medical Director of the Roffey Park Rehabilitation Center, Horsham, England.

### First Institute on Rehabilitation Problems in Puerto Rico

An Institute on Rehabilitation was held in San Juan, Puerto Rico from February 1 to 4, 1950 under the auspices of the Department of Physical Medicine and Rehabilitation, State Insurance Fund of Puerto Rico. Co-sponsors of the Institute were the Bureau of Crippled Children, Department of Health; the Office of Vocational Rehabilitation, Department of Education of the government of Puerto Rico and the International Society for the Welfare of Cripples.

The purposes of the Institute were to: (1) inform the public concerning physical medicine and rehabilitation; (2) study rehabilitation problems in Puerto Rico; (3) show what is available in this field of medicine and (4) determine ways and means of cooperation between public and private agencies to bring about the establishment of rehabilitation centers.

The program of the Conference was planned by Dr. Herman J. Flax, Director, Department of Physical Medicine and Rehabilitation, State Insurance Fund, Puerto Rico.

### Rehabilitation of the Disabled Advanced in U. S. During 1949

As evidence of the growing interest in rehabilitation as an integral part of medical care, new departments of rehabilitation and physical medicine were created in medical schools and hospitals, and additional community rehabilitation centers were opened.

Illustrative of the new hospital programs is that at Goldwater Memorial Hospital for Chronic Disease. Another is the rehabilitation service being planned at the Ball Memorial Hospital in Muncie, Ind. Similarly in Peoria, Ill., the new chronic disease hospital being built by the Forest Park Home Foundation is to have a rehabilitation service.

Among the new community rehabilitation centers either planned or started last year were those at Evansville, Ind., Dayton, Ohio, and Detroit.

Colorado amended its special education law to include the cerebral palsied, and Kansas made special reference to the cerebral palsied in creating its new division of special education. Texas, New York and Georgia made appropriations specifically for them, and Maryland, Michigan and Minnesota raised their state aid allowances to

local school districts for the education of all handicapped children. — [Rusk, N. Y. Times.]

### Reopen Hospital Clinic at Lorain

Lorain's crippled children's clinic reopened last fall at St. Joseph's Hospital after a seven-year lapse due to lack of personnel.

Treatment is supervised by Drs. J. I. Kendrick, Cleveland orthopedist, and L. C. Riffin, Lorain health commissioner.

The commissioner estimates that 100 children in the area need physical therapy and that eventually all of them will be under treatment at St. Joseph's.

Type of treatment at the clinic depends on the nature of incapacity. The patients may be fitted for shoes, braces, casts or may be operated upon. Physical therapy is also available.

### Will Investigate Role of Disabled in Communities

Approximately 500 physically disabled persons who last year completed rehabilitation training in four New York hospitals staffed by New York University College of Medicine physicians will be surveyed to determine the roles they have assumed in the daily lives of their communities.

Announcement of the survey was made by Dr. Currier McEwen, Dean of the College, a unit of the New York University-Bellevue Medical Center, who said that the research project will be carried out under a grant of \$40,000 from the New York Foundation. The project will be carried out over a two year period.

Commenting on the project, Dr. Howard A. Rusk, Professor and Chairman of the Department of Physical Medicine and Rehabilitation at the College, said that the research is being undertaken to determine on a large scale basis the effectiveness of physical medicine and rehabilitation techniques in restoring disabled persons to normal living.

"The need for such knowledge is critical because of the rapid rise in the incidence of disabled persons in this country," Dr. Rusk said. "The life-spans of our people have been increased but there has been an accompanying increase in chronic diseases with their disabling aftermath. It is the aim of this project to obtain knowledge that will make possible better care for not only the chronically ill and aged but for all types of disabled persons."

The research project will be directed by Mrs. Georgia F. McCoy, formerly a Public Assistant Analyst for the Federal Security Administration and will have its headquarters in Bellevue Hospital. Persons to be included in the survey are former patients of two municipal hospitals, Bellevue and Goldwater Memorial, and of University Hospital and the Institute of Physical Medicine and Rehabilitation.

In outlining details of the project's program, Mrs. McCoy said that each of the rehabilitated persons to be included had been discharged from the hospital during 1949. "Details to be sought

will serve to shed light on the problems of the disabled in their communities," Mrs. McCoy said. A personal interview will be held with each rehabilitated person approximately one year after his return to life in his community. Mrs. McCoy and two assistants will travel to West Virginia, Pennsylvania and Kentucky to interview as many as possible of more than 100 paraplegic coal miners who underwent rehabilitation for broken backs at the Institute of Physical Medicine and Rehabilitation.

### Dr. Sheehan Named Acting Dean

The resignation of Dr. James J. Smith, dean of the Stritch School of Medicine of Loyola University, and the appointment of Dr. John F. Sheehan as acting dean were announced January 13. The new acting dean, who took office January 16, has been chairman of the pathology department since 1940. He joined Loyola's faculty in 1937 after teaching at Holy Cross College, Worcester, Mass.; Georgetown University, Washington, D. C.; and Tufts College Medical School, Boston. A native of Manchester, N. H., he received his M.D. degree from Georgetown University School of Medicine, Washington, D. C., in 1933. He served his residency in pathology at the Mallory Institute of Pathology, Boston City Hospital.

### Dr. Hawley Made Director of American College of Surgeons

Dr. Paul R. Hawley has resigned as chief executive officer of the Blue Cross and Blue Shield Commissions to become the director of the American College of Surgeons, effective March 1, succeeding Dr. Malcolm T. MacEachern, who, as director emeritus, will devote his major attention to continued supervision of the program of hospital standardization. After a long and distinguished record of service, he was commissioned a major general in 1944 and during World War II served as chief surgeon of the European Theater of Operations, retiring from the army in that rank in 1946. After the war General Hawley was selected to reorganize and direct the department of medicine and surgery of the Veterans Administration, from which position he resigned in the winter of 1947, later becoming executive officer of the Blue Cross and Blue Shield, the two largest organizations in the field of voluntary health insurance. Dr. Hawley has been awarded the Distinguished Service Medal, the Legion of Merit and the Bronze Star Medal. His new office will be at the headquarters of the American College of Surgeons, 40 East Erie Street, Chicago.

### Change in Jonas Policy of Distribution of Handbook, "Nursing for the Poliomyelitis Patient"

As of March 1, 1950, a charge of 35¢ per copy will be made for the 88-page handbook, "Nursing for the Poliomyelitis Patient," published in 1948. Sale of this publication is limited to nurses, physi-



cians, physical therapists, and members of allied professional groups — in accordance with policies of the medical department of The National Foundation for Infantile Paralysis. Orders should be sent to the Joint Orthopedic Nursing Advisory Service, 1790 Broadway, New York 19, N. Y.

### Meeting on Cerebral Palsy

The American Academy for Cerebral Palsy held its annual meeting at the Waldorf-Astoria, New York, February 17-18, under the presidency of Dr. George G. Deaver, New York. The program was as follows:

Arnold Gesell, New Haven, Conn., Developmental Approach to Cerebral Palsy.

George P. Guibor, Ottawa, Ill., Ocular Deviations in Cerebral Palsy.

Jon Eisenson, Ph.D., New York, Aphasia.

Herman Josephy, Chicago, Brain Pathology of Cerebral Palsy.

Charles F. McKhann, Cleveland, Revascularization of the Brain.

Fremont A. Chandler, Chicago, Orthopedic Surgery in Cerebral Palsy.

Bronson Crothers, Boston, Interference with Social Development by Cerebral Palsy.

Leslie B. Holman, Durham, N. C., Principles of Behavioristic Training in Cerebral Palsy.

Mr. Alfred Strauss, Racine, Wis., Educational Approach in Cerebral Palsy.

Winthrop Phelps, Baltimore, Bracing.

Samuel M. Wishik, New York, Standards for Training Personnel and Treatment Centers.

Albert B. Sabin, Cincinnati, Diagnostic Methods for Evaluating Role of Toxoplasmosis in Cerebral Palsy.

### About Medical Journals New and Changed

*Journal of the Philadelphia General Hospital*, a quarterly published by the hospital, has appeared. It is edited by Dr. Pascal F. Lucchesi, superintendent and medical director, and a consulting board of editors including Drs. William P. Boger, Jefferson H. Clark, William E. Ehrich, Thomas M. McMillan, John F. Stouffer and Bernard P. Widmann. For information address Shalom O. Waife, M.D., associate editor.

*Angiology, The Journal of Vascular Diseases* appeared in February as a bi-monthly publication of the Angiology Research Foundation. The editor is Dr. Saul S. Samuels, New York.

*Today's Health* is name effective with the March, 1950, issue of *Hygeia*, health magazine of the American Medical Association. Dr. W. W. Bauer is the new editor succeeding Dr. Morris Fishbein, and Dr. William Bolton, Chicago, is the new associate editor. Ellwood Douglass will continue as managing editor.

### Acknowledgment

We regret that in the manuscript of the article entitled "Objective Recording of Muscle Strength," which was published in the February, 1950 issue of the ARCHIVES, the reference numbers over the first sentence in paragraph one and paragraph two of page 91 were overlooked in the typing. Consequently, due credit was not given to the source, "Muscles, Testing and Function" by H. K. Kendall, and F. M. Kendall, Williams & Wilkins Co., 1949, for approximately the first half of the article. However, the work of the Kendalls was referred to in another part of the article.

Khalil G. Wakim, M.D., Ph.D.

Jerome W. Gersten, M.D.

Earl C. Elkins, M.D.

Gordon M. Martin, M.D.

### Herman G. Fischer, Noted Manufacturer, Dies

Herman G. Fischer, 71, for 40 years a leader in the manufacture of X-ray, electromedical and electrosurgical equipment, died March 12, in Hinsdale, Illinois.

Mr. Fischer was chairman of the H. G. Fischer & Co., of Franklin Park, Illinois, which he founded more than 40 years ago. He was a former president of the Goodwill Industries, and at his death a director of this organization and the Division Street, Chicago, Y. M. C. A. Mr. Fischer was well known to many members of the Congress. The ARCHIVES extends sincere sympathy to his family.

### Upton Giles

It is with regret that we announce the death in New Orleans, of Dr. Upton Giles, a member of the Congress for many years.

### James E. Hughes

It is with regret that we announce the death, Dec. 31, 1949, of one of our Congress members, Dr. James E. Hughes, Indianapolis.





## BOOK REVIEWS

**SURGICAL MANAGEMENT OF VASCULAR DISEASES.** By *Gerald H. Pratt, M.D., F.A.C.S.*, Associate Clinical Professor of Surgery, New York University; Chief of the Vascular Clinic and Associate Attending Surgeon, Saint Vincent's Hospital, City of New York; Diplomate of American Board of Surgery; Commander Medical Corps, United States Naval Reserve. Cloth. Price, \$10.00. Pp. 496, with 181 illustrations. Lea & Febiger, 600 S. Washington Square, Philadelphia 6, Pa., 1949.

This is a new volume on a subject that has shown dramatic advances in the past few years. The recent developments which have expanded the possibilities of surgery for the cardiovascular system and the improvements in the surgical technic and the better understanding of the numerous vascular lesions which have been employed for many years surely justifies the publication of such a book.

The book is divided into six sections opening with a brief discussion of nomenclature and case history. In the chapter on case history, the history and physical examination charts used at the Vascular Clinic of Saint Vincent's Hospital, New York City, are reproduced. These are excellent and include the more pertinent information helpful in arriving at the correct diagnosis.

The chapter on interruption of the sympathetic system, covered in 24 pages, discusses the physiology, indications and contraindications for surgical intervention and a brief description of the operative technic in a most adequate and concise manner. Unnecessary words and unnecessary ideas are omitted.

Section V contains short chapters on surgery of the heart particularly the four congenital lesions which have been performed during the last decade with such marked success. A very short chapter in this section considers the possibilities of surgery for coronary heart disease and other procedures which have been advocated in an effort to improve the collateral circulation to the heart.

The last part deals very briefly with special techniques such as angiography, cardiac, arterial and venous catheterization, care of varicose ulcers, and various other miscellaneous subjects.

The other sections, which make up the bulk of the book, cover the arterial, venous and lymphatic systems completely. Here the emphasis is on surgery for these disorders as the name implies, however, the author includes the usual consideration of symptoms, signs and general medical management. These parts are unusually good — short, non-controversial, sufficiently inclusive and up-to-date. Suggestions about physical medicine are sensible and give evidence of sufficient experi-

ence; for example, six lines are devoted to the suction pressure boot with the final advice as follows "we have discontinued its use." The surgical aspects consider not only the technic but all the factors in the actual surgical management such as preparations before surgery, dressings, need for transfusions, anti-coagulants and everything else. In the post-operative care, the author shows an appreciation for a rehabilitation program.

This is a valuable and modern work from a real authority on the subject and should be helpful to surgeons, general practitioners and students.

**SCIENTIFIC AUTOBIOGRAPHY AND OTHER PAPERS.** By *Max Planck*. Translated from German by *Frank Gaynor*. Fabrikoid. Price, \$3.75. Pp. 192. Philosophical Library, Inc., 15 East 40th Street, New York 16, N. Y., 1949.

This volume consists of an introduction by Max von Laue and five essays by Planck, all in English translation. The translations are excellent and very readable. Laue's contribution was a memorial address delivered in Göttingen after the death of Planck in 1947, and opens one's eyes to the true greatness of a physicist who could still contribute to his science after losing a son in each of the two world wars, the burning of his house, and the complete disappearance of his library. Of the five essays, undoubtedly the most valuable is the first, from which the volume takes its name. It sketches the author's relation to the other famous personalities involved in the rise of relativity theory, quantum mechanics, wave mechanics, and nuclear physics, and could hardly have been written by anybody but Planck. The remaining four essays, while readable and interesting, are more broadly philosophical in content.

**THE WORLD AS I SEE IT.** By *Albert Einstein*. Translated by *Alan Harris*. Cloth. Price, \$2.75. Pp. 112. Philosophical Library, Inc., 15 East 40th St., New York 16, N. Y., 1949.

A non-mathematical book, it contains an abridged collection of comments, opinions, letters, speeches and other public utterances by Albert Einstein on a variety of subjects.

The book is in four sections. The first part, "The World As I See It," is a general philosophical view on life by the author. In the section, "Politics and Pacifism," he defends his opinions on the importance of securing international peace and maintaining it without resorting to war. His observations regarding Germany in 1933 are recorded. In the final section, "The Jews," he discusses his stand relative to the Zionist question.

Thus reviewer found the book most stimulating and constructive. The personality, charm and

shrewd observations of Dr. Einstein are brought out vividly in the book. Although Einstein is usually associated with complicated mathematical theories, it is relevant to state that not a single mathematical equation appears in the book.

**AUDIOLOGY. THE SCIENCE OF HEARING, A DEVELOPING PROFESSIONAL SPECIALTY.** By *Norton Canfield, M.D.*, Associate Professor of Otolaryngology, Yale University School of Medicine; Board of Directors, Audiology Foundation; Board of Directors, American Hearing Society; Vice-President, International Audiology Conference; Consultant in Audiology, Veterans Administration; Consultant in Otolaryngology, Office of the Surgeon General, Department of the Army, Washington, D. C. Fabrikoid. Price, \$1.75. Pp. 45. Charles C Thomas, Publisher, 301-327 East Lawrence Avenue, Springfield, Illinois, 1949.

This booklet, a monograph, deals with a specialty which is gaining stature in the field of rehabilitation. The science of hearing, audiology, is striving to cope with the ever increasing problems of the deafened, especially since the average life span has been lengthened.

Although few audiology centers exist in the United States at present, it is, nevertheless, the leading nation to set up these specialized services to test the hearing and make appropriate recommendations for hearing rehabilitation. The book describes the purposes of an audiology center, what it can do for the deafened, and how the service can be improved.

There is a large bibliography for the size of the book referring to many excellent papers on the subject. It is not a textbook or manual on acoustics or audiology but serves more as a summary of the present status of this branch of science.

**RECENT ADVANCES IN PHYSIOLOGY.** By *W. H. Newton, M.D., M.Sc. (Manch.), D.Sc. (Lond.)*, Professor of Physiology in the University of Edinburgh. Seventh edition. Fabrikoid. Price, \$4.50. Pp. 268, with 90 illustrations. The Blakiston Company, 1012 Walnut Street, Philadelphia 5, 1949.

The war interrupted publication of this valuable review of recent advances in physiology by Newton. It is the seventh edition and the first issued since 1939 — an interval of ten years. While the chapters are fewer than in previous editions they are all new. The author states it is not the purpose to impart the greatest amount of knowledge which could be introduced in its pages, but rather to indicate to the student certain modern currents of thought, anchoring him meanwhile near one of the main sources. Newton has made every effort to select subjects of interest and importance, to record the facts accurately. Where deemed necessary an explanatory background has been provided.

There are ten chapters and the following subjects are studied: The physical basis of temperature regulations; water diuresis; digestion; some

aspects of the physiology of pregnancy; blood pressure and the kidneys; catheterization of the heart; the electrical excitation of nerve; cutaneous sensation; auditory impulses; and color vision. This is a most timely and judicious selection and the author has shown a scholarly interpretation of the material consulted.

The chapter on the basis of temperature regulation should be digested by every physiologist because of its importance to his specialty. This is also true of the chapters on the electrical excitation of nerve and cutaneous sensation. The current activity in catheterization of the heart and proximal vessels should also prove of value. This is a small compact volume full of valuable physiologic studies and should be in the library of every physiologist. It is highly recommended.

**THE SEXUAL CRIMINAL. A PSYCHOANALYTICAL STUDY.** By *J. Paul de River, M.D., F.A.C.S.*, Criminal Psychiatrist and Sexologist, Los Angeles Police Department, Consultant Alienist to the Superior Courts, City and County of Los Angeles, Founder and Director of the Sex Offense Bureau, City of Los Angeles. Fabrikoid. Price, \$5.50. Pp. 281, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1949.

This book on the sexual criminal while not pleasant reading is a most valuable and timely contribution to medicine. The author has selected the case histories of sexual criminals to illustrate fully the various types of sexual psychopaths the writer has taken from his own files. Dr. de River has succeeded admirably in a task that while perhaps distasteful was a definite duty. The subject matter is dealt with in a practical and concise manner. Irrelevant and unnecessary details are omitted so that the purpose of the presentation is not lost. The author states that the book is intended principally for the medical and legal profession and for those teachers of sociology and criminology intent on familiarizing themselves with the sexual psychopath. It is essential we have a full understanding of these pariahs of society. Because the medical curriculum of medical schools in this country does not include sexual psychiatry the book should fill a most important gap in medical education. Postgraduate study along these particular lines is not available in any of the hospitals in this country. Hence, this field has been sadly neglected and it is the hope of the author that this presentation will serve as a stimulus for future research in this field.

The book is divided into three parts: part one, deals with sadism; part two, masochism; and part three, with the psychologic aspect of criminal investigation. In addition there is a full and valuable glossary of terminology.

This book should be read by every physician, in fact, it is one of the must books. The medical profession and society as a whole are greatly indebted to Dr. de River for his courageous contribution.

**A TEXTBOOK OF NEUROPATHOLOGY WITH CLINICAL, ANATOMICAL AND THERAPEUTIC SUPPLEMENTS.** By Ben W. Lichtenstein, B.S., M.S., M.D., Associate Professor of Neurology, University of Illinois College of Medicine; State Neuropathologist, Illinois Neuropsychiatric Institute; Attending Neurologist, Cook County Hospital; Professor of Neurology, the Cook County Graduate School of Medicine; Attending Neuropsychiatrist, Mount Sinai Hospital, Chicago. Cloth. Price, \$9.50. Pp. 474. W. B. Saunders Company, 218 West Washington Square, Philadelphia 5, 1949.

Acute and chronic neurologic diseases constitute such an important portion of the practice of physical medicine and rehabilitation that this new text should be welcomed by all students of the specialty and also as a reference by the practicing physiatrist and neurologist and medical student. The presentation is not too technical for the clinician and contains excellent classical as well as modern bibliographic material for use of the specialist in neuropathology. The illustrations are excellent and numerous. Supplements include listings of clinical syndromes alphabetically with a brief summary of normal histologic neuroanatomy and outlines of neuropathologic techniques. A similar supplement on neurophysiology could be added to advantage together with some standard anatomical diagrams to make the text a more complete unit. This book is highly recommended for the use of medical students and those training in neurology, neurosurgery and physical medicine.

**RECENT PROGRESS IN HORMONE RESEARCH. THE PROCEEDINGS OF THE LAURENTIAN HORMONE CONFERENCE. VOLUME IV.** Edited by Gregory Pincus. Cloth. Price, \$8.80. Pp. 529. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y., 1949.

This is a report on the fourth of the hormone conferences. Contributions of the leading manufacturers of biological products enable the holdings of these meetings, and the standards set by a distinguished committee on arrangements for the presentation of original work are high. The four main chapters in this year's volume are: Steroid Hormone Metabolism in Vivo and in Vitro, The Role of Hormones in Tissue and Body Metabolism, Neurohumoral-Hypothalamic Relationships, and Thyroid Physiology and Function. Among the topics presented by outstanding investigators are: Some Aspects of Progesterone Metabolism, G. F. Marrian, University of Edinburgh; The Metabolism of the Estrogens, R. D. H. Heard, McGill University; The Antihormone Problem in Endocrine Therapy, James H. Leatham, Rutgers University; The Pancreas as the Guardian of the Liver, C. H. Best, University of Toronto; Metabolic Changes in Man Following Adrenal and Pituitary Hormone Administration, George W. Thorn and Peter H. Forsham, Harvard Medical School; Physiologic Reactions of the Thyroid Stimulating Hormone, Rulon W. Rawson and William L. Mowry, Sloan Kettering Institute,

New York; and The Metabolism of Iodine in Man as Disclosed with the Use of Radioiodine, F. Raymond Keating, Jr. and A. Albert, Mayo Clinic. A full, unhampered and critical discussion, full references at the end of each paper, and a complete author and subject index at the end of the volume make this an indispensable guide for all physicians and research workers in one of the most complex and fascinating fields of progress in modern medicine.

**INVESTIGATIONS WITH RESPECT TO THE DESIGN CONSTRUCTION AND EVALUATION OF PROSTHETIC DEVICES. VOLUMES I and II.** Research Division, College of Engineering, New York University. Prepared for Office of Naval Research, Special Devices Center, Sands Point, L. I., New York. Project No. 80—Report No. 80.10, Contract N6 ONR-279.

All those concerned with the care of the above-the-knee amputees should find the summary of this report of interest. To any doing or contemplating research in the design and use of prosthetic devices, the detailed technical reports should be required reading. The subjects evaluated are the use of a force plate for gait study, different types of knee mechanisms, amputee training and psychological factors. This is a truly objective scientific investigation yielding definite contribution and opening the way for future research.

**BLOOD AND PLASMA TRANSFUSIONS.** By Max M. Strumia, M.D., Sc.D. (Med.), Associate Professor of Pathology, Graduate School of Medicine, University of Pennsylvania; Director, Laboratory of Clinical Pathology, and of the John S. Sharpe Research Foundation, Bryn Mawr Hospital; Member, Subcommittee on Blood Substitutes of the National Research Council, 1940-1945. John J. McGraw, Jr., M.D., Instructor in Pathology, Graduate School of Medicine, University of Pennsylvania; Assistant Attending Pathologist, Bryn Mawr Hospital; Formerly, Commanding Officer of the Blood Bank for the Mediterranean Theater of Operations, Chief of the Blood Research Division of the Army Medical School, and Special Representative to the Surgeon General on Blood and Plasma Transfusion. Price, \$7.50. Pp. 497, with 124 illustrations. F. A. Davis Company, 1914 Cherry St., Philadelphia 5, 1949.

This is a comprehensive monograph on the subject of blood and blood-transfusions which have in the past decade assumed a place of ever-increasing importance in therapy. In most instances of actual practice the indications for blood and plasma transfusion are left to the practicing physician or surgeon, while the operation of the blood bank and the preparations for transfusion are generally the responsibility of the clinical pathologist. Because of the dual nature of the problem of transfusion, technical and clinical phases are brought together in this volume. The section on the functions of the blood, the pages related to the practical aspects of the Rh factor, the indications for transfusion, and the chap-

ter on adverse reactions and transmission of diseases have been written especially for the clinician. The organization and operation of a blood-transfusion service, and the use of group-O donors as universal blood donors should be of equal interest to the clinician and to the laboratory man. The remaining chapters deal with problems of technic, and are written particularly for the clinical pathologist and for the laboratory worker. The volume thus represents a rational clinical approach and endeavors to show the simplest and most satisfactory methods.

**MASSAGE AND REMEDIAL EXERCISES IN MEDICAL AND SURGICAL CONDITIONS.** By Noel M. Tidy, Member of the Chartered Society of Physiotherapy. T. M. M. G. Eighth edition. Cloth. Price, \$5.25. Pp. 487 with illustrations. The Williams and Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1949.

The eighth edition is a sound and popular text on massage and remedial exercises in which the author has supplemented the section on respiratory diseases and brought up-to-date that on anterior poliomyelitis. Although it has been written essentially as a text for the physical therapist, this work can be used to advantage by the physician. Each disorder is considered from the standpoint of etiology, physiology and pathology, so that the basis of physical treatment may be presented in a systematic manner and the reader can then appreciate the significance of contraindications to treatment.

In the chapters on fractures and disorders of the nervous system, the author carefully describes each condition, concluding with a system of physical treatment. Together with the usual technic a program of variable exercises is included for the more common and important disorders. Controversial subjects are referred to authoritative sources.

Many of the exercises are shown in the 190 illustrations.

**IRON METABOLISM.** By A. Vannotti, M.D., Director of the Medical Polyclinic and Professor of Internal Medicine in the University of Lausanne. A. Delachaux, M.D., Lecturer of the Medical Polyclinic of the University of Lausanne. Cloth. Price, \$6.50. Pp. 267. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1949.

In recent years numerous clinical and experimental observations have shown, not only that the presence of iron in the organism is important for cell formation and for the part played by haemoglobin in the organism, but that iron has much more far-reaching activity. Actually iron plays the part of catalyst in a number of chemical processes, and so this led gradually to the conviction that this metal is not only useful, but even indispensable for the life of animal cells and of the entire organism. In this study, carried out with the subsidy of the J. Macy, Jr. Foundation of New York, the authors endeavored to show that the serum iron is not only

a factor in the determination of certain definite clinical problems, but rather the manifestation of a biologically important element in connection with the function and regulation of the total organism. The authors believe that the study of iron metabolism, even outside the domain of erythropoiesis, is today indispensable for every practitioner, from the point of view both of diagnosis and treatment. The three parts of the volume are The Biological Significance and Normal Metabolism of Iron, Iron Metabolism Under Pathological Conditions, and Clinical Indications and Practical Considerations in Iron Therapy. The original edition of this monograph was first published in German in Switzerland.

**PROCEEDINGS OF THE FIRST CLINICAL ACTH CONFERENCE.** Edited by John R. Mote, M.D., Medical Director, Armour Laboratories. 178 Contributors. Cloth. Price, \$5.50. Pp. 607, with illustrations. The Blakiston Company, 1012 Walnut Street, Philadelphia 5, Pa., 1950.

This book is so important that this review is released immediately. A hurried reading of several chapters impressed this reviewer sufficiently to endorse it unreservedly and to urge anyone who is even remotely interested in the latest information on the properties of this hormone to secure a copy. The understanding of the effect of the adrenal cortex or the means by which it may be stimulated will influence every phase of medicine and not the least of which will be physical medicine.

This volume covers the proceedings of the first conference on ACTH (adrenocorticotrophic hormone) held in Chicago on Oct. 21 and 22, 1949. The fifty-two papers presented at the conference and the informal discussions are given which include many studies on the physiologic and pathologic effects of this compound, the description, utilization and rationale of the varied laboratory procedures and the results in the treatment of a wide variety of diseases such as chronic neurological disorders, alcoholism, myasthenia gravis, severe personality disorders, bronchial asthma, ulcerative colitis, the collagen diseases about which most of the publicity has been directed and numerous others.

The material in this book has not been published elsewhere so that it represents the latest data on this subject. It is obvious that reports will appear in ever increasing numbers in the medical journals and even the preliminary studies included in this work will be enlarged and revised at a later date but this will require months. Here in this one volume is the collection of the extensive work which has been completed during the past three years and is available now.

The publisher is to be complimented and congratulated in his realization that work of such stupendous importance should be released with speed.

## PHYSICAL MEDICINE ABSTRACTS

**Vitamin B<sub>12</sub> and Coordination Exercises for Combined Degeneration of the Spinal Cord in Pernicious Anemia.** Byron E. Hall; Frank H. Krusen, and Henry W. Woltman.

J. A. M. A. 141:257 (Sept. 24) 1949.

Properly directed coordination exercises serve as an important motivating force in hastening recovery and rehabilitating patients who may have been disabled for some time. More than this, the exercises actually assist coordination and restore strength of muscles which may not have functioned properly since the neurodegenerative changes of pernicious anemia first manifested themselves.

In order to study the effect of the coordination exercises alone, in 1 patient the vitamin B<sub>12</sub> therapy was withheld for ten days and exercises only were used. There was distinct evidence of improved coordination, even though there had been no arrest or reversal of the neurodegenerative changes. When vitamin B<sub>12</sub> was finally added to the therapeutic regimen, the patient made even more rapid progress.

The simple arrest or reversal of the neurodegenerative changes by the administration of vitamin B<sub>12</sub> without the use of a well directed exercise program will not accomplish return toward normal coordination and function of the extremities as rapidly as when the exercises are added. This is particularly true in the cases of more advanced changes in which there is both incoordination and muscular weakness.

All exercises are prescribed specifically. Each one is repeated no more than four times every three hours. These patients tend to lose the sense of fatigue, and consequently it is important to prevent them from overexercising.

Later, patients are given exercises while in the sitting position and are taught how to sit down and how to get up from a chair. Unless corrected, such patients tend simply to let themselves fall into the chair. On rising, they may not be able to balance on the toes; therefore the body must be bent forward to throw the center of gravity over the heels.

Still later, walking exercises are begun, first sideways (because this is easier) and then forward, at first with a cane and later without one. The patient tends at first to walk too fast, and this tendency must be corrected.

Despite Murphy's advocacy of therapeutic exercise in conjunction with liver therapy, recently some physicians seem to have overlooked this valuable aid to prompt recovery following the administration of agents which produce adequate hemopoietic responses in combined degeneration of the spinal cord in pernicious anemia.

It seems evident that vitamin B<sub>12</sub> produces optimal hemopoietic response and maximal arrest or reversal of neurodegenerative changes in pernicious anemia. When a suitable regimen of therapeutic exercises is added, disappearance of muscular incoordination and return toward normal muscular function are accelerated. Thus, maximal recovery in a minimal length of time is achieved.

**When Is Surgery Necessary?** M. E. Pusitz.

Cerebral Palsy Rev. 11:1 (Jan.) 1950.

There is much confusion, at the present time, as to the exact status of surgery in the treatment of cerebral palsy. The reason becomes obvious when the historical development of this specialized field is considered. Muscle education forms the nucleus in the whole program of physical treatment.

Early treatment will prevent many contractures (but not all of them). Milder deformities, of course, can always be handled with nonsurgical measures. Moderately severe deformity may take so long, even if it can be done, as to make the conservative method not worthwhile. Severe contractures cannot be handled with physical therapy alone.

**Lesions of the Eye From Radiant Energy.** David G. Cogan.

J. A. M. A. 142:145 (Jan. 21) 1950.

The long infrared radiation which has given rise to ocular lesions (cataracts) has been largely derived from open furnaces such as were formerly employed by professional glass blowers and certain foundrymen (chain makers and the like) and those working in soaking pits. The short infrared radiation which has been harmful to the eye (retinitis) has been partly from electric arcs but chiefly from the sun. Radiation with the visible rays may in sufficient dosage be similarly harmful to the retina. The common sources of harmful, or abiotic, ultraviolet radiation (keratoconjunctivitis) are the welders' arc and the quartz mercury vapor lamp. The sun is also a source of ultraviolet radiation, but the amount in the abiotic range filtering through the atmosphere is too slight to be harmful except under extraordinarily clear conditions or at high altitudes.

The apparent susceptibility of certain structures in the eye to the harmful effects of particular wave bands of radiant energy depends in part on the transmission of the overlying ocular media and in part on the specific absorption of those structures for those particular wave bands.

The long radio-diathermy waves are transmitted through the eye readily without appreciable absorption and therefore produce little biologic ef-



fect, but the short diathermy waves, those of the order of several centimeters, induce heat effects in the eye with potentially deleterious effect on the anterior segment of the eye.

Radiation burns of the eye are either permanent or spontaneously reversible. There is no specific form of therapy for any of them. There is no real basis for the claim that infrared radiation will neutralize the abiotic action of ultraviolet radiation.

The only adequate form of treatment for radiation lesions of the eye is prophylaxis. Prophylaxis against infrared radiation can be theoretically accomplished by workers wearing glasses with metallic oxides to remove the infrared rays but from a practical point of view this is difficult. Contrary to popular opinion, it is safe to use merely tinted glass or photographic film which cuts down the visible rays and lets the infrared through. The special ultraviolet-absorbing glasses which have been widely marketed are unnecessary for all practical purposes.

**Painful Sequelae of Injuries to Peripheral Nerves. S. Sunderland, and M. Kelly.**

Australian & New Zealand J. Surg. 18:75 (Oct.) 1948.

In the 278 cases analyzed by Sunderland and Kelly, severe pain in the hand or foot persisted for at least five weeks after the receipt of an injury to a nerve trunk and the pain was not related to damage or to involvement of non-neural tissues. The term *causalgia* has been applied to this pain, which is primarily a sequel of gunshot lesions in which stretch of the nerve appears to play an important part. In the great majority of cases it follows damage to the main sensory pathways from the palm or the sole. The higher in this pathway the level of the lesion, the more likely is *causalgia* to ensue. Its incidence bears no relation either to neuroma formation or to the degree of visible damage to nerves or other tissues. Though sympathectomy has proved valuable, there is no other evidence to suggest that the sympathetic system is especially involved. The clinical evidence suggests that the painful sequelae of nerve injuries are the effect of the spread of damage to the central nervous system by retrograde and transneuronal changes. A center of abnormal spontaneous activity is thereby set up in the cord, which acts as a focal point for the dissemination of spreading disturbances involving wider and wider areas of the cord. These produce effects on the peripheral tissues via adjacent posterior roots (hyperalgesia); while a succession of abnormal impulses reaches the cerebrum, producing effects on the sensorium (spontaneous pain). Anatomic and physiologic evidence is produced which lends support to this interpretation. In most cases of *causalgia* there is spontaneous cure, and surgery should therefore be reserved for the cases of severe and stubborn *causalgia*.

**A Simplified Method for the Determination of Circulating Red-Cell Volume with Radioactive Phosphorus. E. B. Reeve and N. Veall.**

J. Physiol. 108:12 (March 1) 1949.

Hevesy and his colleagues developed a method for labelling red blood cells in vitro with the radioactive phosphorus isotope  $P^{32}$  and they applied this method to the estimation of the total volume of the circulating red cells. It seemed that this method might be considerably simplified if it were possible (a) to inject radioactive red cells without radioactive plasma and (b) to avoid the wet-washing of packed red cells and the precipitation of phosphorus. Experiments have therefore been carried out to establish and to test a method in which the radioactive red cells were washed free from radioactive plasma before they were injected, and in which the radioactivity measurements were carried out to establish and to test a method in a specially designed counter. The total red-cell volume in man is measured from the dilution of injected washed red cells, labelled in vitro with  $P^{32}$ . The red cells are prepared by incubating whole blood with  $P^{32}$  and afterwards washed almost free of their radioactive plasma. Following injections of suspensions of such washed red cells,  $P^{32}$  is lost very slowly from the circulation. The results given by the method agree with results given by other reliable methods. The method also has been checked in vitro. A specially designed Geiger-Müller counter taking liquid samples much simplifies the necessary manipulations of standards and samples. Apart from knowledge of radioactive technic, the method requires no great technical skill in its use.

**Involvement of Eyes in Poliomyelitis: Experiences During Epidemic in Berlin in 1947. R. Collin, and W. L. Bassenge.**

Klin. Monatsbl. f. Augenh. 113:209, 1948.

Collin and Bassenge made ophthalmologic studies on 40 patients who had received treatment in the "iron lung" in the course of the epidemic of poliomyelitis in Berlin in 1947, in which a total of 2,300 cases were reported. Seventy other patients with poliomyelitis, who did not require treatment in the "iron lung," were also given a thorough examination of the eyes. The ophthalmologic examination was repeated at regular intervals, so that it was often possible to observe the appearance and rapid disappearance of symptoms. A third group of 40 patients, who had persistent spinal paralysis after an attack of poliomyelitis, were examined for late eye symptoms. Three and one-half months was the time that had elapsed after the acute attack. Involvement of the eye is not a rarity in poliomyelitis. Nuclear and supranuclear paralysis of the facial nerve, ptosis, abducens paralysis and paralysis of the internal rectus muscle of the eye were observed. There is a good prospect that these types of paralysis will subside. In the cases of poliomyelitis in which lesions exist in the upper part of the spinal cord, involvement of the sympathetics

may produce disturbances in the pupils. The majority of the patients who required treatment in the iron lung showed signs of stasis in the retinal vessels and in the optic papilla. Although optic neuritis was not encountered during this epidemic, it may be expected to occur. The authors believe that in patients with obscure paralysis of some of the cerebral nerves, poliomyelitis should be considered. It is advisable to hospitalize these patients, not only to prevent further spread of the poliomyelitis, but also because special care may become necessary, since the lesion is close to the respiratory center.

#### Industrial Accidents and Peripheral Vascular Diseases. S. S. Samuels.

Indust. Med. 18:133 (April) 1949.

Samuels calls attention to the close relation between peripheral vascular diseases and serious complications resulting from slight trauma. Many cases of leg amputations for gangrene have resulted in delayed claims for compensation. After the leg has been removed the patient may recall that the gangrene preceding the amputation was produced by some insignificant trauma. Patients with preexisting arterial insufficiency in the extremities, as in Buerger's disease or arteriosclerosis obliterans, are particularly susceptible to the development of gangrene if subjected to minimal trauma which would not be serious if the circulation were normal. The patient with preexisting arterial insufficiency in the extremities is susceptible to effects of exposure to a cold environment to a much greater degree than a person with normal circulation. Workers in butcher shops or refrigerated food compartments, as in ship storage rooms, or employees in street-cleaning departments are all candidates for the disability if the circulation in the extremities is deficient. The increasing use of electrical vibrating tools and pneumatic hammers has produced a form of Raynaud's syndrome of the fingers and hands which may cause total disability. Evidence of this condition indicates the advisability of immediate change of occupation. Many prospective employees with advanced arterial disease of the lower extremities slip through physical examination undetected in occupations where such a disease would be a serious hazard. Physicians have not been sufficiently trained in the detection of arterial disturbance. A simple test consists in having the patient, while in a recumbent position, elevate the legs to an angle of about 45 degrees. The feet are then flexed and extended rapidly at the ankle joints, and the plantar surfaces are observed. If ischemia should develop, this is evidence of organic arterial insufficiency.

#### Why Are Fever Temperatures Over 106 F. Rare? E. F. DuBois.

Am. J. M. Sci. 217:361 (April) 1949.

According to DuBois there is still much to be learned about temperature regulation in health

and even more about fever. Little is known regarding the details of the chemical, electrical and physical reactions which occur in the hypothalamus and skin in response to changes in temperature. It is by delicate adjustments in these tissues that the balance between heat loss and heat production is maintained. A survey was made of 1,761 temperature readings in 357 patients suffering from diseases characterized by high grade fever. Only 4.3 per cent of the temperatures were above 106 F. (41.1 C.). None was above 107.8 F. (42 C.). In these fevers 608 readings were between 104 and 105 F. (40.0 to 40.6 C.). Less than half as many fell between 102 and 103 F. (38.9 to 39.4 C.). These are indications that in these fevers the "thermostat level" for the temperature-regulating mechanism was set in the neighborhood of 104 and 105 F. Temperatures much higher than 106 F. can be found in several conditions other than infectious diseases. The normal temperature-regulating mechanism may be overwhelmed suddenly by a fever cabinet or gradually by heat stroke with its exhaustion of the sweat glands. The mechanism together with the peripheral circulation often fails in moribund patients. Except for these anomalous conditions temperatures are kept safely below the danger level by an "emergency regulatory mechanism in fever" which acts chiefly through the peripheral circulation and the sweat glands.

#### Value of Early Recognition and Early Therapy in Cerebral Palsy. Margaret Watkins.

J. Am. M. Women's A. 4:48 (Feb.) 1949.

According to Watkins cerebral palsy is widespread, for each year there are born 7 per hundred thousand population. Of these 7, 1 will die in infancy and 2 will be feeble minded, leaving 4 who are treatable or educable. Of these 4, the condition of 1 will be severe, of 2 moderate and of 1 mild. The physician should see that the children with this condition are directed to a center where they can be given the proper therapy, the proper education and instruction. It should be remembered that because of impairment of the neuromuscular system these children do not do automatically these things which they should do, but can be taught a different type of muscle control by early training in good patterns of behavior before bad habits are established. The treatment is a combination of physical therapy, occupational therapy and speech therapy. As soon as cerebral palsy is recognized the baby should be started on conditioned exercises. The parents are taught exercises to be given while a simple rhyme is sung; in other words, conditioned response based on Pavlov's experiments. Through constant repetition of the rhyme and the exercise, passive motion is changed to active assisted motion and finally to active motion. The exercises are designed to teach reciprocation of the legs and reach and grasp of the arms and hands.



**Brachial Neuritis Due to Cervical Intervertebral Disk Lesions. E. Walker.**

J. Georgia M. A. 38:1 (Jan.) 1949.

According to Walker, rupture or herniation of a cervical intervertebral disk is the usual cause of pain which extends from the lower cervical portion of the spine into the upper extremity. The clinical picture is that of so-called brachial neuritis with pain involving one of the lower cervical nerve roots. The patient usually complains of pain over the suprascapular region, often radiating into the shoulder region and distally down the arm. If the nerve root is sufficiently damaged, there may be reflex or sensory changes, and these neurologic findings will be of considerable importance in determining which nerve root is involved and which disk is ruptured. Roentgen studies of the cervical part of the spine will aid in the diagnosis. In most cases the pain subsides spontaneously within a few days of conservative treatment consisting of rest and immobilization. Symptomatic therapy is given for the relief of pain. In the more persistent cases a cervical brace or even head traction may be useful. When the pain is severe and persists, surgical decompression of the nerve root is the treatment of choice.

**The Effect of Exercise and Body Position on the Venous Pressure at the Ankle in Patients Having Venous Valvular Defects. Albert A. Pollack; Bowen E. Taylor; Thomas T. Myers, and Earl H. Wood.**

J. Clin. Investigation 28:559 (May) 1949.

The purpose of this investigation was to determine directly and record continuously the effects of body position and of walking on the venous pressure at the ankle in patients having incompetent veins of the lower extremity. Venous pressure in the greater saphenous vein at the ankle was studied in 13 patients with varicose veins while resting in the recumbent, seated and standing positions and while walking on a treadmill. Confirmatory data were obtained indicating that the venous pressure at the ankle in the resting, sitting or standing positions in normal subjects and patients with incompetency of the saphenous veins is sufficient to support a column of blood to approximately the level of the third thoracic interspace. Walking on a level treadmill at 1.7 miles per hour produced an average decrease in mean venous pressure at the ankle of 37 (30 to 47) mm. of mercury in seven patients with primary varicose veins and 11 (5 to 13) mm. of mercury in six patients with varicose veins associated with a history of a previous iliofemoral thrombophlebitis. In normal subjects this value was 64 (54 to 71) mm. of mercury. In patients who had uncomplicated incompetency of the greater saphenous vein the average time required for the venous

pressure to return to the resting standing level after cessation of walking was 28 (12 to 55) seconds. In those patients with a history of previous iliofemoral thrombophlebitis the pressure rose to levels slightly in excess of the control resting value within one second after completion of the walk as contrasted to the 31 (8 to 57) seconds required for the pressure to return to the control values after walking in normal subjects. These data are in harmony with the concept that the function of the venous valves in conjunction with the action of voluntary muscles is of primary importance in the regulation of venous pressure at the ankle.

**Treatment of Cerebral Palsy: Clinical Study in Use of D-Tubocurarine in Peanut Oil and Myricin. Carl L. Holm; Edmund V. Olsen, and Robert S. Dow.**

Northwest Med. 48:320 (May) 1949.

Cerebral palsies of childhood are disorders so difficult to treat that any drug, which promises to facilitate well-tried orthopedic and physical therapy measures, is worthy of serious consideration even though a curative result is not expected. In the treatment of spastic disorders with curare it is theorized that, by using small doses, a partial block can be maintained at the myoneural junction, thereby reducing the abnormal stimuli produced by the upper motor lesion and the stretch reflex. On the other hand, voluntary impulses of sufficient magnitude will be able to traverse the block, allowing motion that was previously masked by spasticity. It is questionable whether or not this is the complete picture, as recent animal experiments have shown that curare also acts on the central nervous system. Centrally, the synapse is considered to be the site of action. The action of *d*-tubocurarine is now thought by some to be widespread, embracing all cholinergic terminals throughout the body, preventing response to acetylcholine. *d*-Tubocurarine in peanut oil and myricin is no substitute but rather an adjunct to the present therapeutic procedures of education, physical therapy, and surgery in cerebral palsy. Early recognition, classification and treatment are of prime importance.

**An Electromyographic Study of Spasticity. D. B. Lindale; L. H. Schreiner, and H. W. Magoun.**

J. Neurophysiol. 12:197 (May) 1949.

Electromyographic study of spasticity following injury to suppressor systems of the cat's brain indicated that its most characteristic feature was an exaggeration of stretch reflexes, chiefly in anti-gravity muscles. Threshold was low, response was excessive and its prolongation after stretch was frequent. In addition, tendon reflexes were augmented and repetitive and commonly induced clonus.

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 Cayo, Ernest P., Santa Rosa Hospital, San Antonio.  
 Dear, Richard H., Lt. Col., MC, U. S. A., Brooke Gen. Hospital, Ft. Sam Houston.  
 Duvall, Ellen N. (Assoc.), Univ. Texas, Dept. Phys. Health Educ., Austin 12.  
 Flannery, John J., Hospital in the Hills, Blanco.  
 Gibson, Mitchell O., 308 National Bank Bldg., Lufkin.  
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 Hart, W. Lee (Hon.), 2211 Oak Lawn Ave., Dallas 4.  
 Jenkins, Jessie G., Scott & White Clinic, Temple.  
 Ledbetter, Harry W., Hamilton Bldg., Wichita Falls.  
 Loving, Maribel, 712 Capitol National Bank Bldg., Austin 16.  
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 Strickland, Benjamin A., Jr., Lt. Col., MC, U. S. A., School of Aviation Med., Randolph Field.  
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 Tate, James, Lt. Col., MC, U. S. A., Brooke Gen. Hospital, Ft. Sam Houston.  
 Teveluwe, William A., P. O. Box 874, Blanco.  
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## Utah

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## Virginia

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 Buchanan, Josephine J., Woodrow Wilson Rehabilitation Center, Fishersville.  
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 Ferry, Allen M., 25th and Army Navy Dr., S., Arlington.  
 Fischer, Ernst, 3318 Chatham Rd., Richmond 22.  
 Fitzgerald, J. O., Jr., 1103 W. Franklin St., Richmond 20.  
 Hellebrandt, Frances A., 4318 Stonewall Ave., Richmond 24.



Hoffman, Carl C., 3405-R S. Stafford St., Fairlington, Arlington.  
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 Lee, Walter J., Barnch Center of Physical Med., Medical Coll. of Virginia, Richmond 19.  
 Malcomson, Joseph E., Hotel John Randolph, South Boston.  
 Weems, Rachel F., 114 N. Center St., Ashland.

#### Washington

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 Lund, Herman C., Chief, Physical Medicine and Rehabilitation, VA Hospital, Walla Walla.  
 Williams, Clark B., Madigan Gen. Hospital, Tacoma.

#### West Virginia

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 Zintek, Sylvester S., Newton E. Baker Adm. Center, Martinsburg.

#### Wisconsin

Anderson, F. A. (Assoc.), Burdick Corp., Milton.  
 Crosley, George E., % Burdick Corp., Milton.  
 Egan, William J., 720 N. Jefferson St., Milwaukee 2.  
 Freedman, Albert L., 606 Bellin Bldg., Green Bay.  
 Ground, W. E., Board of Trade Bldg., Superior.  
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 Rasmussen, Alfred T., 210 Linker Bldg., La Crosse.  
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 Ethier, J. A. C., 84 Rue King Ouest, Sherbrooke, Quebec.  
 Fisk, Guy Hubert, 592 Walpole Ave., Montreal 16, Quebec.  
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 Jousse, Albin T., 66 Willowbank Blvd., Toronto 12, Ontario.  
 Kidd, James A., Perth, Ontario.  
 Lawson, Gordon, 36 Lawrence Ave., E., Toronto, Ontario.  
 Leatherbarrow, Albert, Hampton Station, New Brunswick.

Mancuso, Ferdinand, 3535 Park Ave., Montreal, Quebec.  
 McGuffin, Chester, 220 12th Ave., W., Calgary, Alberta.  
 McRae, Joseph R., 1989 Queen St., E., Toronto, Ontario.  
 Storms, Harold D., Convalescent Centre, Malton, Ontario.

#### Hawaii

Mil'et, Byron L., Jr., Tripler Gen. Hospital, Box 211, Honolulu, T. H.  
 Mirikitani, Isami, King Kalakaua Bldg., Honolulu, T. H.

#### Puerto Rico

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#### Mexico

Chavez, Nicando, Facultad Nacional de Medicina, Querretaro 24.  
 Quezada, Juan Jose, Calle Cuba 58, Mexico City.  
 Tohen, Z. Alfonso, Guanajuato 224, Mexico City.

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 Cassinotti, Mario A., Professor de Fisica Medica de la Facultad Medicina Soriano 1171, Montevideo, Uruguay.  
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 De Oliveira, Jose Godinho, R. D. Joas V. 24, Lisbon, Portugal.  
 Guna'p, Fevzi, Numune Hospital, Ankara, Turkey.  
 Kiernander, Basil, 12 Harley St., London, W. 1, England.  
 Laqueur, A., Ataturk Bulvari 219, Yenischir, Ankara, Turkey.  
 Lippman, Arthur S., 175 MacQuarie St., Sydney, Australia.  
 Luzes, Formigal, Avenida de Libertad 164.1, Lisbon, Portugal.  
 Mennell, James B. (Hon.), Courts of the Morning, Rake, Liss, Hants, England.  
 Mennell, John McM., 6 Waterloo Quadrant, Auckland C. 1, New Zealand.  
 Nova, Fernando, Caixa Postal 600, Salvador Bahai, Brazil.  
 Schembri, John, 125 High St., Qormi, Malta.  
 Taliberti, Roberto, Clinica de Reabilitorno Fisica, Rua Rego Freitas #279, Sao Paulo, Brazil.

#### Address Unknown

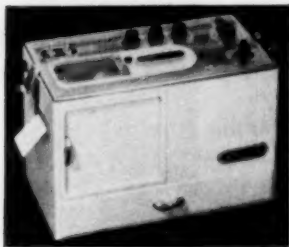
Billman, James.  
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June 28, 29 and 30, 1950

OFFICERS OF THE SECTION

Chairman: Frank H. Krusen, The Mayo Clinic, Rochester, Minnesota  
Secretary: Howard A. Rusk, New York University College of Medicine, New York, New York

**WEDNESDAY, JUNE 28th: 2 p.m.**

Practical Aids in the Rehabilitation of the Hemiplegic. LEONARD J. YAMSHON, College of Medical Evangelists, Los Angeles, California.

Application of Muscle Physiology to Therapeutic Exercise. DONALD J. ERICKSON and KHALIL G. WAKIM, The Mayo Clinic, Rochester, Minnesota.

Comprehensive Physical Medicine for Degenerative Joint Disease. WALTER M. SOLOMON, Western Reserve University Medical School, Cleveland, Ohio.

The Place of Artane and Tolserol in Spastic Disorders. WARD SCHULTZ. (by invitation) and ABRAHAM EFFRON, New York University College of Medicine, New York, New York.

The Community Rehabilitation Center and the General Practitioner. ARTHUR C. JONES, University of Oregon Medical School, Portland, Oregon.

Medical Physics, Physical Medicine and Rehabilitation. WALTER J. ZEITER; SHELBY G. GAMBLE, and OTTO GLASSER, Ph.D., (by invitation), Cleveland Clinic Foundation, Cleveland Ohio.

A Study of the Adjustment of 500 Persons Over 16 Years of Age with Disabilities Resulting from Poliomyelitis. GEORGE C. DEEVER, New York University College of Medicine New York, New York.

**THURSDAY, JUNE 29th: 2 p.m.**

Election of Officers.

Chairman's Address:

The Scope and Future of Physical Medicine and Rehabilitation. FRANK H. KRUSEN, The Mayo Clinic, Rochester, Minnesota.

Physical Medicine and Rehabilitation in Medical Education. HOWARD A. RUSK, New York University College of Medicine, New York, New York.

Retraining Patients with Brain Damage. JOE R. BROWN, The Mayo Clinic, Rochester, Minnesota.

Amputee Rehabilitation. THOMAS J. CANTY, Commander, MC, U. S. Navy, U. S. Naval Hospital, Mare Island, Vallejo, California.

Intermittent Treatment of Poliomyelitis with Progressive Resistance Exercise. SEDGWICK MEAD, Washington University School of Medicine, St. Louis, Missouri.

The Concept of 'Acceptance' in Physical Rehabilitation. MORRIS GRAYSON, New York University College of Medicine, New York, New York.

**FRIDAY, JUNE 30th: 2 p.m.**

Symposium on Physical Medicine and Rehabilitation for Paraplegics.

Urological Aspects of Rehabilitation in Spinal Cord Injuries. ERNEST BORS. (by invitation), Birmingham V. A. Hospital, Van Nuys, California.

Neurosurgery in the Rehabilitation of Paraplegics. JOHN D. FRENCH. (by invitation), Birmingham V. A. Hospital, Van Nuys, California.

Reconstructive Surgery in Spinal Cord Injuries. A. ESTIN COMARR. (by invitation), Birmingham V. A. Hospital, Van Nuys, California.

Physical Treatment and Rehabilitation of the Paraplegic Patient. HAROLD DINKEN, University of Colorado, Denver, Colorado.

# SYMPOSIUM ON PHYSICAL MEDICINE AND REHABILITATION

Wednesday Afternoon, April 26, 1950

WENONAH HOTEL

BAY CITY, MICHIGAN

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## AFTERNOON SESSION — 2 P. M.

Presiding Chairman — FREDERIC G. HOUSE, M.D.

Address of Welcome — MICHAEL J. DARDAS, M.D., Chief of Staff,  
Bay City General Hospital.

Address of Welcome — MANA KESSLER, M.D., Chairman, Department  
of Physical Medicine and Rehabilitation, Bay City General Hospital.

1. **Physical Medicine and Rehabilitation in Poliomyelitis.** MORTON HOBBERMAN, M.D., Columbia University, College of Physicians and Surgeons, New York, N. Y.;
2. **Control of Spasm in Poliomyelitis.** WILLIAM D. PAUL, M.D., Associate Professor of Medicine and Chairman of the Division of Physical Medicine, College of Medicine, State University of Iowa, Iowa City, Ia.;
3. **Prescription Writing in Physical Medicine and Rehabilitation.** GORDON M. MARTIN, M.D., Department of Physical Medicine, Mayo Clinic, Rochester, Minn.;
4. **Hemiplegia. Neurosurgical Management.** ELISHA S. GURDJIAN, M.D., Professor, Neurosurgery, Wayne University, Detroit;
5. **Hemiplegia. Medical Management.** MAX K. NEWMAN, M.D., Grace Hospital, Wayne University, Detroit.

## EVENING SESSION — 6:30 P. M.

Presiding Chairman — FREDERIC G. HOUSE, M.D.

Invocation.

Address of Welcome — HON. A. A. CEDERBERG, Mayor, Bay City.

Address of Welcome — MR. GEORGE McPHAIL, City Manager, Bay City.

Address of Welcome — DWIGHT J. MOSIER, M.D., President, Bay County Medical Society.

6. **Physical Medicine and Rehabilitation in Fractures.** MILAND A. KNAPP, M.D., Clinical Associate Professor of Radiology and Physical Medicine, University of Minnesota Medical School, Minneapolis.
7. **Present Concept of Physical Medicine and Rehabilitation.** ALLEN H. RUSSEK, M.D., Assistant Professor of Physical Medicine and Rehabilitation, Department of Physical Medicine and Rehabilitation, New York University College of Medicine, New York, N. Y.

---

Preprandial Meeting, Bay City General Hospital,

Department of Physical Medicine, 5-6 P. M.

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# AMERICAN CONGRESS OF PHYSICAL MEDICINE

# SPRING SESSION

## EASTERN SECTION

In Conjunction with the New England Society of Physical Medicine, the Section on Physical Medicine of the Medical Society of the County of Kings, the New Jersey Society of Physical Medicine, the New York Society of Physical Medicine, the Pennsylvania Academy of Physical Medicine and the Society of Physical Medicine of the District of Columbia.

**SATURDAY, APRIL 29, 1950 AT 2:00 P.M.**

George Washington University Hospital

901 23rd Street, N. W.

Washington, D. C.

1:00 P.M. Registration and Tour of the Department of Physical Medicine, George Washington University Hospital, Washington, D. C.

### AFTERNOON SESSION — 2 P.M.

1. **Rehabilitation in Chest Surgery** — BRIAN BLADES, M.D., Prof. Surgery, George Washington Univ. School of Med., Washington D. C.; Director Thoracic Surgery, VA, and Consulting Surgeon, Walter Reed Hospital.  
Discussion: Lt. Col. John H. Kuitert, M.C., Chief, Physical Medicine, and Director, Army School of Physical Therapists, Clinical Branch, Walter Reed General Hospital, Washington, D. C.; Harry Kessler, M.D., Dept. Physical Medicine and Rehabilitation, VA, Washington, D. C.; Sidney Licht, M.D., Assistant Professor of Physical Therapy, Sargent College.
2. **The Use and Abuse of Physical Therapeutic Measures in Peripheral Vascular Diseases** — ANDREW G. PRANDONI, M.D., Associate in Medicine, George Washington Univ. School of Med., Washington, D. C.; Consultant, Walter Reed General Hospital, Washington, D. C.  
Discussion: A. A. Martucci, M.D., Chief, Physical Medicine and Rehabilitation, Phila. General Hospital; William Bierman, M.D., Asst. Clin. Prof. Medicine, Columbia Univ. College of Physicians and Surgeons, N. Y. C.
3. **Fractures at the Elbow — Indications and Contraindications of Physical Therapeutic Measures** — MILTON C. COBEY, M.D., Assoc. Prof. Orthopedic Surgery, Georgetown Univ. School of Med.  
Discussion: Bror S. Troedsson, M.D., Director, Dept. Physical Medicine, Orange Memorial Hospital; Harold Lefkoe, M.D., Orthopedic Surgeon, St. Luke's and Children's Medical Center.

### INTERMISSION

4. **Contraindications for Physical Medicine in Neurologic Conditions** — WALTER FREEMAN, M.D., Prof. Neurology, George Washington Univ. School of Med., Washington, D. C.  
Discussion: Richard Kovacs, M.D., Prof. Phys. Med., New York Polyclinic Med. School and Hosp.; Charles A. Furey, M.D., Asst. Chief, Dept. Physical Medicine and Rehabilitation, Phila. General Hosp.
5. **Rheumatoid Spondylitis** — DARRELL C. CRAIN, M.D., Clin. Instructor Medicine, Georgetown Univ. School of Med.  
Discussion: William Benham Snow, M.D., Chief, Physical Medicine, Columbia Univ. College of Physicians and Surgeons, N. Y. C.; Jessie Wright, M.D., Director, D. T. Watson School of Physiatry, Leesdale, Pa.

**DINNER 6:30 P.M. AT THE WILLARD HOTEL**  
**GREETINGS FROM CHAIRMEN OF COMPONENT SOCIETIES**  
**EVENING SESSION**

7:30 P.M. **PANEL-SYMPOSIUM: "SHOULDER"**

**Moderator** — WILLIAM H. SCHMIDT, M.D., Director, Department Physical Medicine, Jefferson Medical College and Hospital, Philadelphia.

1. **Functional Anatomy of the Shoulder** — OTHMAR SOLNITSKY, M.D., Prof. Anatomy, Georgetown Univ. School of Med.
2. **Orthopedic Aspects of Shoulder Disabilities** — CARL BERG, M.D., Asst. Clin. Prof. Orthopedic Surgery, George Washington Univ. School of Med.
3. **Physical Medicine in the Treatment of Shoulder Disabilities** — K. G. HANSSON, M.D., Assoc. Prof. Cornell Univ. Med. Coll.; Director, Physical Medicine, Hosp. for Special Surgery and New York Hospital.

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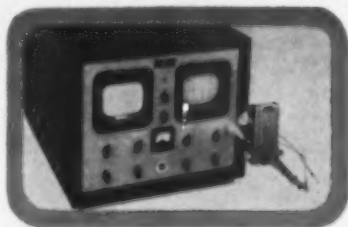
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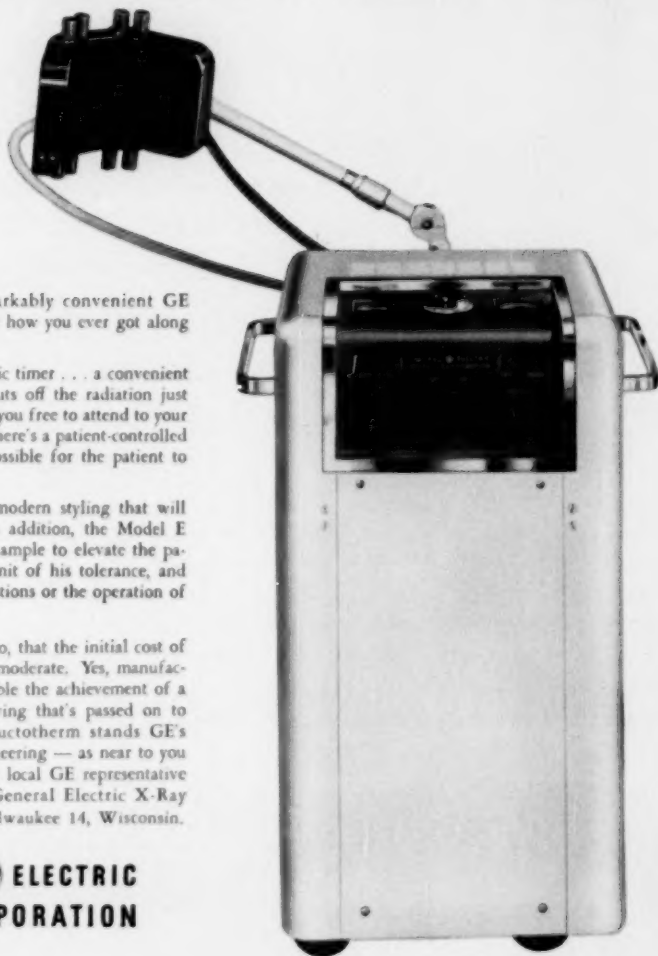
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